Revision of the Chilopoda of New Zealand.

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Part 2.

Order LITHOBIOMORPHA.

Key to the Families occurring in New Zealand.

Eyes present in the form of a group of ocelli. Tibiae of the legs without ectal terminal spines; a number of large socketed spines present on the legs. Pleurae of prehensor segment not extending ventrally to meet in middle line, hence coxosternum of prehensor segment and sternite of first leg-bearing segment touch one another. Fam. Lithobiidae

Eyes present as a single ocellus or absent. Tibae of from 1-11th to 1-14th legs with ectal spinous process; setae on legs not large or socketed. Pleurae of prehensor segment extending ventrally to meet in middle line, hence separating coxosternum from sternite of first leg bearing segment .... Fam. Henicopidae

Eyes present; antennae with 19 or more joints; coxal pores on 12-15th or 13-15th legs .... Sub-fam. Henicopinae

Eyes absent; antennae with 13-17 joints; coxal pores on 14-15th legs. . Sub-fam. Anopsobiinae

FAMILY LITHOBIIDAE.

Key to New Zealand Genera.

Prosternal teeth of prehensors 4 + 4 or 5 + 5. Fourth joint of anal legs in the male not possessing a special nodular process at its distal end .... Lithobius

Prosternal teeth of prehensors 2 + 2. Fourth joint of anal legs in the male with a special nodular process at its distal end .... Walesobius

Genus Lithobius Leach, 1814.

1814 *Lithobius* Leach, Brewster's Edin. Ency. VII. (2), p. 408.
1815 *Lithobius* Leach, Trans. Linn. Soc. London, XI. (2), p. 381.

Lithobius argus Newport, 1844.

Lithobius argus, Newport, Trans. Linn. Soc. London, vol. 19, p. 369, 1844. *Lithobius argus,* Pocock, Ann. Mag. Nat. Hist., 6th ser., vol. 8, p. 153, footnote, 1891. *Lithobius argus,* Archey, Trans. N.Z. Inst., vol. 49, p. 304, 1916.

"Ferrugineus, capite parvo subconvexo, antennis pilosis, ocellis parvis brunneis utrinque 28-30, labio angustato emarginato polito: denticulis 10 nigris. Long. unc. 9/10."

"Hab. in Nova Zelandia, prope Wellington (v. in Mus. D. Hope.)"—Newport.

The type is still the only specimen known of this species. Newport's description, although not very extensive, is explicit enough with regard to the number of ocelli and prosternal teeth of the prehensors. Pocock (1891, p. 153) draws attention to the fact that the specimen was preserved in the Hope Museum at Oxford **under the name** *zelandicus.*

Genus WALESOBIUS Chamberlin 1920.

Type, by original designation, *Lithobius sydneyensis* Pocock, 1891.
1920 *Walesobius* Chamberlin, Bull. Mus. Comp. Zool., vol. 64, No. 1, p. 77.

Antennal joints 26 to 28; prosternal teeth only 2 + 2. The fourth joint of anal legs in the male with a special nodular process at its distal end. Posterior angles of 9th, 11th and 13th tergites produced. Coxal pores in a single series on the last four pairs of legs. Posterior coxae not armed laterally. Ventral spines of anal legs 0, 1, 3 or 4, 2 or 3, 1. Claw of female gonopods bifid, basal spurs 2 + 2.

Walesobius sydneyensis (Pocock) 1891. Pl. 16, figs. 1 to 6.

Lithobius sydneyensis, Pocock, Ann. Mag. Nat. Hist., ser. 6, vol. 8, p. 153, 1891. *Walesobius sydneyensis* Chamberlin, Bull. Mus. Comp. Zool. vol. 64, No. 1, p. 77, 1920.

Antennae generally with 26 joints, the first two large, thence distad becoming steadily smaller and also relatively longer than wide, the terminal joint more than three times longer than wide. Antennae moderately supplied with long slender setae, these becoming more abundant distad; the number of segments varies from 25 to 31, but a greater number of segments is not related to a greater size of the individual. Head sub-cordate, anterior margin with a slight swelling arising from the middle of a median depression; hinder margin straight, with a broad raised edge which extends one third of the way along the sides; frontal sulcus distinct; ocelli (fig. 2) ten, arranged in three rows 4, 4 and 2, the posterior ocelli being somewhat the larger. Tergite of prehensor segment distinctly visible. Tergites (fig. 1) 1, 3, 5, 8, 10 and 12 with raised lateral and caudal margins; tergites 2, 4, 6, 9, 11, 13, 14 and 15 with raised lateral borders only; the 7th with lateral borders and with a wide raised border on the lateral portions only of the hinder margin; hinder margins of 14th and 15th sinuate; 9th, 11th and 13th with prominent triangular latero-caudal projections.

Prehensors (fig. 3): prosternum divided by a distinct median suture; anterior margin mesally excavated, with 2 + 2 teeth.

Sternites sparsely hairy, not medially impressed. Coxal pores $\frac{3342}{3332}$ to $\frac{6775}{6875}$, increasing in number in larger individuals, and also with a larger number in females than in males of the same size.

First pair of legs: ventral spines varying from 00011 to 00231; ventral spines on 15th pair varying from 01310 to 01421, in both cases the greater number being present on the larger specimens.

Gonopods of ♀ (fig. 6) with long sharp basal spurs and bifid terminal claw.

Length: 8 to 17 mm., average length of those examined 14.5 mm.

Distribution: New South Wales and Auckland, N.Z.

The only other species of this genus, *Walesobius excrescens* Attems (1928, p. 78), differs from *W. sydneyensis* apparently only in the arrangement of the eyes, of which there is a large ocellus in the **front** of the group in the former and at the back of the group in the latter. In all other respects the specimens I have examined agree with the published descriptions of both species.

This species exhibits the same variation in the number of coxal pores in relation to the sex and the length of the individuals as we have found to hold in the other families and orders of New Zealand chilopoda. The increased number of spines on the legs in larger individuals is also an expected variation.

Family HENICOPIDAE.

Sub-family HENICOPINAE.

Key to the N.Z. Genera.

1. First to 13th legs with tarsi tri-articulate, 14th and 15th legs with tarsi 6-jointed .... *Henicops* Newport
2. First to 12th legs with tarsi uni-articulate, 13th to 15th legs with tarsi bi-articulate
    - (a) Prosternum of prehensors with dental edges rounded and narrow, teeth 1.2 + 2.1 (Pl. 18, fig. 6) .... *Lamyctes* Meinert
    - (b) Prosternum of prehensors with dental edges straight and broad, teeth 4 + 4 to 6 + 6 (Pl. 22, fig. 2) .... *Wailamyctes* Archey
3. All the legs with tarsi bi-articulate ..... *Paralamyctes* Pocock
4. Coxal pores reduced to one on each of last four coxae; 15th pair of legs much shorter than 14th and without protarsal segment .... *Haasiella* Pocock

Genus HENICOPS Newport, 1845. Pl. 17, figs. 1-7.

Type: *Henicops maculatus* Newp.

1845 *Henicops* Newport, Trans. Linn. Soc., vol. 19, p. 372.
1877 *Henicops* Hutton, Ann. Mag. Nat. Hist., 4th ser., vol. 20, p. 114.
1878 *Henicops* Hutton, Trans. N.Z. Inst., vol. 10, p. 288.
1891 *Henicops* Pocock, Ann. Mag. Nat. Hist., 6th ser., vol. 8, p. 154.
1901 *Henicops* Pocock, Ann. Mag. Nat. Hist., 7th ser., vol. 8, p. 453.
1917 *Henicops* Archey, Trans. N.Z. Inst., vol. 49, p. 304.
1928 *Henicops* Attems, Ann. S. African Mus., vol. 26, p. 62.

Head with one ocellus on each side; antennae with 30 or more joints.

Tergites (Pl. 17, fig. 1) with caudal margins distinctly emarginate and posterior angles produced, rounded or toothed. Spiracles on segments 1, 3, 5, 8, 10, 12 and 14. Mandibles (figs. 3, 3a) with complex cutting teeth, a fringe of laciniate processes on one side and a tuft of short simple hairs on the other.

First pair of maxillae (fig. 2) with rami incompletely separated from coxae, inner ramus with simple and plumose hairs; outer ramus with plumose hairs along inner edge and simple setae elsewhere. Palp of second maxillae tripartite, distal joint with plumose hairs distally on inner margin, elsewhere with simple setae; terminal claw bifid.

Prosternum of prehensors (fig. 5) narrowed anteriorly armed with 2 + 2 or 3 + 3 teeth. Tarsi of 1st to 13th legs 3-jointed, 14th and 15th with four to six joints. Claws with two spinules.

Coxal pores on last four pairs of legs. Gonopods of female with 2 + 2 basal spurs.

Two species of *Henicops* have been recorded in New Zealand, *H. maculatus* Newport and *H. impressus* Hutton, but the only difference between them is that the prehensor teeth are 3 + 3 in the former and "eight" (presumably 4 + 4) in the latter. I have examined many specimens of *Henicops* and all have 3 + 3 teeth. The type of *H. impressus* is unfortunately lost, and the status of the species cannot be definitely decided. I have, however, examined so many specimens of *H. maculatus*, including several from both Dunedin and Queenstown, the type localities of *H. impressus*, that I have been forced to the conclusion that the slight difference recorded is insufficient to maintain *H. impressus* as a distinct species, and I therefore now follow Pocock (1891, p. 154), who records Australian specimens with 4 + 5 prosternal teeth, in uniting it with *H. maculatus*.

The species of *Henicops*.

1. *Henicops maculatus* Newport, 1844. *H. impressus* Hutton, 1877. New Zealand, Tasmania and Eastern Australia.
2. *Henicops dentatus* Pocock, 1901. W. Australia.
3. *Henicops oligotarsus* Attems, 1911. W. Australia.

It is not yet posisble to draw up a key to the three species of *Henicops*, because one of them is founded on a mutilated specimen. *H. dentatus* Pocock, from W. Australia, is described as having much more spiny tarsi than *H. maculatus*, and with more deeply (and subquadrately) emarginate tergites: the posterior legs, however, were missing. *H. oligotarsus* Attems (also from W. Australia) also has richly setose legs and was separated by Attems from "Allen ubrigen Arten" on account of the reduction of tarsal joints to 4 in the 14th and 5 in the 15th leg. But we do not know how many tarsal points there are in the 14th and 15th legs of *H. dentatus*, and there is a possibility that it may be the same as *H. oligotarsus*. For the present, however, we may note that the two Western Australian species have more spiny legs and deeper tergal emarginations than the New Zealand and Eastern Australian species, *H. maculatus*.

Henicops maculatus Newport, 1844. (Pl. 17, figs. 1-7).

Henicops maculatus Newport, Trans. Linn. Soc., vol. 19, p. 372, pl. 33, fig. 37, pl. 40, fig. 3, 1844. Haase, Indo-Austral. Chilopoden; Abhand. Dresden Mus., No. 5, p. 36, 1877. Pocock, Ann. Mag. Nat. Hist., ser. 6, vol. 8, p. 154, 1891. Pocock, ibid, ser. 6, vol. 11, p. 125, 1893. Pocock, ibid, ser. 7, vol. 8, p. 453, 1901. Archey, Trans. N.Z. Inst., vol. 49, p. 306, 1917. Chamberlin, Bull. Mus. Comp. Zool., vol. 64, No. 1, p. 73, 1920. Attems, Ann. S. African Mus., vol. 26, p. 62, 1928.

Colour deep reddish brown, each tergite with an irregular broad dark brown edging and a median broad dark brown band; the general appearance being a reddish brown groundwork with three longitudinal dark bands; the head is also dark around the margin.

Head subcordate, sparsely with slender setae; the lateral margins behind the eyes and the caudal margin with an elevated border; frontal sulcus distinct. Antennae with 30 to 37 joints, the number varying evenly around 34.

Tergites (Pl. 17, fig. 1): The first two with straight caudal margins, the remainder emarginate, the posterior minor tergites most deeply so; the anterior tergites with lateral and caudal margins with raised edges, the posterior tergites with less distinctly raised edges.

Prosternum of prehensors (fig. 5) produced anteriorly, the dental margins slightly rounded and with 3 + 3 sharp teeth.

Legs long and setose; 1-13 with tarsi tri-articulate; 14th and 15th normally with a protarsus of 2 segments and a tarsus of 4. There is, however, some variation here, the 14th leg sometimes having 3 + 3 or 2 + 3 tarsal segments, and the 13th being sometimes divided into 2 + 2 or even 3 + 3 segments. Caution must therefore be used in applying tarsal subdivisions as a specific character. The tarsi of all legs with spinules beneath, set at the distal ends of the subsegments. The 15th legs more than half the body length. Tibial spur present on 1st to 14th legs.

Coxal pores small, varying in number with sex and size, males having definitely fewer and smaller pores than females of the same size. Commonly in 14 mm. specimens $\frac{3444}{3444}$ in males and $\frac{4555}{4555}$ in females.

Gonopods of ♀ (fig. 6) with 2 + 2 basal spurs all of even length, but the mesal ones slightly slenderer and sharper; claw curved and hollow within. Gonopods of ♂ (fig. 7) slender 3-jointed processes terminating in a long, rapidly narrowing seta-like process.

Length up to 16 mm.

Distribution: Throughout New Zealand, in bush and under stones in open tussock country. It occurs also in Eastern Australia and Tasmania. Hutton's remark (about *H. impressus)*: "It is astonishing with what rapidity this creature runs," is descriptive of all specimens of *H. maculatus*.

Genus LAMYCTES Meinert 1868.

Type, by original designation: *L. fulvicornis* Mein.

Lamyctes Meinert, Nat. Tidsskr., vol. 5, p. 226, 1868; *Henicops* Latzel Myr. Ost. Ung. Mon. 1, p. 132, 1880; *Lamyctes* Pocock, Ann. Mag. Nat. Hist., 7th Ser., vol. 8, p. 449, 1901; *Lamyctes* Chamberlin, Bull. Mus. Comp. Zool., vol. 57, p. 5, 1912; *Lamyctes* Archey, Trans. N.Z. Inst., vol. 49, p. 307, 1917; *Lamyctes* Attems, Ann. S. African Mus., vol. 26, p. 54, 1928.

Antennae with 24-46 joints. A pair of eyes present.

Labrum unidentate. Mandible (Pl. 18, fig. 4) with four composite cutting teeth, a group of long curved laciniate processes and a tuft of short curved hairs; sometimes the cutting teeth are partially fused together, making apparently only 3 teeth. First maxilla (Pl. 18, fig. 1) outer branch with plumose hairs on inner margin and simple hairs elsewhere, inner branch with simple hairs only; the sternite triangular, divided mesally, sometimes completely *(L. neozelanicus*, fig. 1) and sometimes partly *(L. oticus*, fig. 3) separated from coxa; coxa incompletely separated from inner and outer ramus. Second maxillae with narrow, band-like fused coxosternum; palp 3-jointed, the terminal joint with a composite claw and with one or two plumose setae on inner margin near the end as well as the normal simple setae.

Prosternum of prehensors narrowed anteriorly and with 2 + 2 teeth; 1.2 + 2.1 or 3 + 3 teeth.

Tergites (Pl. 19, fig. 1) usually with caudal margins straight or with but slight emargination and angles lacking acute backward productions. Spiracles on segments 1, 3, 5, 8, 10, 12, 14.

Tarsi of 1st to 12th legs entire, of 13th to 15th 2-jointed. Tibal spur always on 1st to 11th, sometimes on 12th and rarely on 13th and 14th legs. Coxal pores on last four legs. Gonopods of ♀ 3-jointed with 2 + 2 (exceptionally 3 + 3) basal spurs.

Key to New Zealand Species.

Prosternal teeth 2 + 2; first tarsal joint of 15th legs 7 to 8 times as long as wide . . *L. emarginatus* (Newport).

Prosternal teeth 3 + 3; first tarsal joint of 15th leg 4 times as long as wide . . . . *L. oticus* Archey.

These two species are well distinguished, but the identity of the first has for a long time been obscure. Newport's original description, which mentions, rather vaguely, only one character (the prosternal dentition) now considered critical, is quite inadequate, and in the much shrivelled and somewhat mutilated type the prosternal margin is partly hidden among the maxillary rami. It is, however, possible to discern the 2 + 2 prosternal teeth, a condition described by Newport as "three slight emarginations," and in all other respects also the common New Zealand species of *Lamyctes* is identical with it. *L. neozelanicus* Ar. was previously separated on the basis of colour and the number of coxal pores, but colour is variable and the number of coxal pores increases with size and varies between the sexes, and the species is therefore suppressed, together with *L. chathamensis* Ar., previously (1926, p. 39) merged with it.

In the present review I have also included with *L. emarginatus*, *Lamyctes zelandicus* Ch., which is clearly not distinguishable from the common New Zealand species, and *L. tasmanianus* Ch., which differs from *zelandicus* only in size. *Lamyctes navaianus* Ch. and *L. munianus* Ch. from Fiji seem to be no more than small specimens of *L. emarginatus.*

Lamyctes emarginatus (Newp.) 1844. Pl. 18, figs. 1, 2, 4, 6, and pl. 19, figs. 1, 2, 4, 5.

Lithobius emarginatus Newport, Ann. Mag. Nat. Hist., vol. 13, p. 96, 1844; *Henicops emarginatus* Newport, Trans. Linn. Soc., vol. 19, p. 372, 1845; Pocock, Ann. Mag. Nat. Hist., Ser. 6, vol. 8, p. 154, 1891; *Lamyctes emarginatus* Pocock, Ann. Mag. Nat. Hist., Ser. 7, vol. 8, p. 450, 1901; *Lamyctes emarginatus*, Archey, Trans. N.Z. Inst., vol. 49, p. 308, 1917; *L. neozelanicus*, Archey, ibid, p. 309; *L. chathamensis* Archey, ibid, p. 309; *L. kermadecensis*, Archey, ibid, p. 310; *L. emarginatus* Chamberlin, Bull. Mus. Comp. Zool. Harvard, vol. 64, p. 71, 1920; *L. tasmanianus* Chamberlin, ibid, p. 69; *L. zelandicus* Chamberlin, ibid, p. 70; *L. neozelanicus* Archey, Rec. Cant. Mus., vol. 3, p. 39, 1926.

Antennae 25 joints, all rather short.

Head subcordate with frontal sulcus distinct, the sides behind the middle and the caudal margin with raised border. Eyes comparatively large.

Tergites (Pl. 19, fig. 1) with anterior and posterior angles all rounded; the caudal margin of the 8th with a slight emargination, this increasing slightly in depth in posterior segments. Colour rich dark ferrugineous, fading considerably within a few months in spirit.

Prosternum of prehensors (Pl. 18, fig. 6) with anterior margins narrow armed with 2 + 2 teeth, with occasionally a rudimentary outer tooth which might be expressed by the formula 1.2 + 2.1.

Legs: Tibial spur on legs 1-11. Tarsi long and narrow, the first tarsal joint of 15th legs (Pl. 19, fig. 2) 8 times longer than wide. Coxal pores varying from $\frac{1111}{1111}$ to $\frac{4442}{3432}$; commonly in 8.0 mm. specimens $\frac{2221}{2221}$ in males and $\frac{2232}{2232}$ in females. The slight sex difference noted previously for the Cryptopidae and in *Henicops* is apparent here also: in specimens of equal size there are usually slightly fewer coxal pores in males than in females.

Gonopods of ♀ (Pl. 19, fig. 5) : each side of coxosternum with distinctly round caudal margin and with the basal joint of the telopod with similarly rounded meso-caudal margin; two cone-shaped basal spurs, of which the mesial ones are slightly the smaller; claw curved and hollowed within.

Distribution: The whole of New Zealand, Kermadec Islands and Chatham Islands.

Lamyctes oticus Archey, 1921 (Pl. 19, figs. 3, 5; pl. 18, fig. 3).

Lamyctes oticus, Archey, Trans. N.Z. Inst., vol. 53, p. 181, figs. 1-3, 1921.

Antennae 25 joints, all rather short.

Head subcordate, with frontal sulcus distinct, the sides behind the middle and the caudal margin with raised border. Eyes comparatively small. Tergites as in *L. emarginatus.* Colour a deep brown, lacking the ferrugineous element in the colour of *L. emarginatus,* but not really darker.

Prosternum of prehensors (Pl. 19, fig. 5) with anterior margins broader than in *L. emarginatus,* and with 3 + 3 distinct teeth, the outer tooth of each side being somewhat smaller.

Legs: Tarsi of 1st to 12th 1-jointed, 13th to 15th 2-jointed; tarsi of all legs stouter than in *L. emarginatus,* especially in hinder legs: 1st tarsal joint of 15th leg (Pl. 18, fig. 3) four times longer than wide. Tibial spur on legs 1-12 (sometimes 1-11). Coxal pores $\frac{3333}{3333}$. Gonopods of ♀ as in *L. emarginatus.*

Localities: Otekaike (N. Otago) and Queenstown.

Genus PARALAMYCTES Pocock, 1901.

Paralamyctes Pocock, Ann. Mag. Nat. Hist., 7th ser., vol. 8, p. 450, 1901.

Type, by original designation: *P. spenceri* Poc.

Antennal segments 17 to 43; eyes present.

Labrum: (Pl. 21, fig. 1) median piece unidentate, a fringe of long plumose hairs on the lateral pieces. Mandible (Pl. 21, fig. 3) armed with four complex cutting teeth, laciniate processes and a fringe of curved setae. First maxillae (Pl. 21, fig. 2) with a marginal fringe of plumose hairs and a submarginal fringe of simple hairs on the outer ramus, and simple hairs only on the inner . Last joint of palp of second maxillae with plumose hairs on inner margin, simple hairs elsewhere; claw trifid, with the smallest prong lying between a larger prong and a medium sized one. Prosternal teeth of prehensors 2 + 2 to 11 + 11. Posterolateral angles of anterior segments usually rounded; some of posterior segments with angles produced acutely. All the legs biarticulate tibial spurs on 1-13, 1-14, or 1-15 legs. Coxal pores on last four pairs of legs. Gonopods 3-jointed, those of the female with the customary two basal spurs and a curved claw.

Key to New Zealand Species.

Prosternum with up to 11 + 11 teeth and a few hairs (Pl. 20, fig. 4); antennal joints 25-28; fifteenth legs with tibial spur .... *P. validus* Archey

Prosternum with 2 + 2 teeth and numerous short hairs distad (Pl. 20, fig. 5); antennal joints 17 (rarely 20 on one antenna); fifteenth leg without tibial spur .... *P. harrisi* Archey

1. **Paralamyctes validus** Archey, 1917 (Pl. 20, figs. 1, 3, 4, and Pl. 21, figs. 1, 2, 3).

Paralamyctes validus Archey, Trans. N.Z. Inst., vol. 49, p. 314, figs. 28-32a, 1917. *P. dubius* Archey, ibid, p. 314, fig. 36. *Paralmyctes validus* Chamberlin, Bull. Mus. Comp. Zool., vol. 64, p. 73, 1920. *Paralmyctes validus* Archey, Trans. N.Z. Inst., vol. 53, p. 182, 1921.

Colour deep chestnut brown, with darger irregular markings, especially at edges of tergites; legs and end of antennae lighter.

Antennal joints (Pl. 20, fig. 3) 25 to 28, usually 26; in antennae with 26 or more joints the last nine are slightly longer, in antennae with 25 or less joints the last eight are longer. The antennae are somewhat longer in females (half body length) than in males (one-third body length).

Head (Pl. 20, fig. 3) subcordate, with fine frontal sulcus and a median depression in anterior half; sides and caudal margin with raised border. Eyes prominent.

Tergites smooth, sparsely hairy. Anterior tergites only slightly emarginate and with raised border; 7th with hinder margin deeply emarginate but without raised edge, though the sides have the edges raised; eighth only slightly and the other posterior tergites more deeply emarginate, the minor (9th, 11th and 13th) tergites with strongly produced posterior angles.

Prosternum of prehensors (Pl. 20, fig. 4) with broad dental edges armed with 8 + 8 main teeth, with two or three smaller teeth interposed making 10 + 10 or 11 + 11 in all; a few fine hairs on the anterior part of prosterna; claw long and evenly curved.

Tibial spur present on all legs (though ocassionally reduced to a rounded eminence on the 15th), the tarsi long and slender; terminal claws each with a small subsidiary claw on each side. Last pair of legs with first tarsal joint seven times longer than wide; femur nearly twice as wide as tibia.

Gonopods of ♂ (Pl. 21, fig. 4) 3-jointed styles terminating in a short, slender, straight claw or spine with an accessory longer, finer seta. Gonopods of ♀ (Pl. 21, fig. 5) with strong blunt basal spurs (of which the mesial ones are slightly the smaller), and curved fairly sharp terminal claws hollowed within.

Coxal pores set in a deep groove on each coxa; varying in number from $\frac{4444}{4444}$ to $\frac{6666}{6666}$, the number increasing with the length of the specimen. In individuals of the same size and from the same locality the males always have slightly fewer coxal pores, i.e., 18mm. ♀ $\frac{6666}{6666}$ or $\frac{4556}{4556}$, 18mm. ♂ $\frac{4445}{4445}$ or $\frac{4444}{4444}$.

This is a handsome, fast-moving centipede, as fast as *Henicops maculatus* and less difficult to catch only on account of its larger size. It is generally distributed in forest all over New Zealand, but does not occur in open tussock country, as does *H. maculatus*. It is much commoner than the next species (*P. harrisi*), which differs from it in three slight but well-defined characters.

2. **Paralamyctes harrisi** Archey, 1922 (Pl. 20, figs. 2, 5.).

Paralamyctes harrisi Archey, Records Canterbury Museum, vol. 2, p. 75, pl. 13, fig. 4, 1922. *Paralamyctes harrisi*, Attems, Ann. S. African Museum, vol. 26, p. 67, 1928.

This species differs from *P. validus* in the larger size (15 to 22.5 mm. instead of 14 to 20 mm.), in the reduced number of antennal segments (usually 17-17; but occasionally 17-20) and in the greater length and slenderness of these antennal segments, as well as in the reduction of the prosternal teeth to 2 + 2; each prosternum also has antero-laterally a well defined area provided with numerous setae, *P. validus* having only a few scattered setae in this position. Tibial spur present on 1st to 14th legs, absent from 15th.

The possibility that this might be a size- or age-variation of *P. validus* has been considered; but the differences comprise a material reduction in the number, as well as an increase in the size, of the antennal joints, together with a marked difference in the prosternum; and my own detailed observations on all the New Zealand species of Lithobiomorpha indicate a definite increase and not a decrease in the number of antennal joints and prosternal teeth in the larger (and presumably the older) individuals. Failing the establishment of such a reduction in older individuals as a normal phenomenon in the group it seems advisable to regard as specific characters the differences recorded above. The lesser number of coxal pores in males recorded for *P. validus* is also found in this species.

Distribution: Coromandel; Taumarunui; Ohakune; Lake Rotoiti; Waitakere Hills, Auckland; Hokianga; Auckland City.

Attems in his "Key to the species of Paralamyctes" (1926, p. 67) includes *P. harrisi*, but omits *P. validus*, and I therefore present below the same Key modified to include the latter species.

Key to Species of PARALAMYCTES.

1a. Antennae 17-20 jointed 2
  2a. Coxa of prehensors with 2 + 2 teeth (N.Z.) *harrisi* Arch.
  2b. Coxa of prehensors with 3 + 3 to 7 + 7 teeth 3
    3a. Posterior margin of 7th tergite with deep angular notch, the angles toothed. Antennae 20-jointed (Chile) *chilensis* Gerv.
    3b. Posterior margin of 7th tergite straight or with rounded sinus, the angles not toothed. Antennae 20-jointed 4
    4a. Each coxa of prehensors with 3 or 4 teeth. Tibia of 14th legs toothed. Only the 13th tergite with distinct teeth in the posterior angles. (Eleventh tergite with distinct teeth.) Coxal pores oval. Genital spurs of ♀ long, cylindrical. Tergites nearly smooth (S. Africa) .... *weberi* Silv.
    4b. Each coxa of prehensors with 5 or 6 teeth. Tibia of 14th legs not toothed. Tergites 9, 11, 13 distinctly toothed. Coxal pores round. Genital spurs of ♀ short, conical. Tergites rough and creased (S. Africa) .... *spenceri* Poc.
1b. Antennae 23- to 43-jointed 5
  5a. Antennae 35- to 43-jointed 6
    6a. Posterior angles of tergites 7, 9, 11, 13 tooth-like (New Caledonia) .... *humilis* Rib.
    6b. Posterior border of tergites 4, 6, 9, 11, 13, 15 only weakly sinuated (Argentine) .... *andinus* Silv.
  5b. Antennae 23- to 35-jointed 7
    7a. Prosternal teeth of prehensors 6 + 6 or 7 + 7 8
    8a. Tibia of 14th leg not toothed (South Africa) .... *tabulinus* Att.
    8b. Tibia of 14th legs toothed at the end 9
    9a. Tergites creased; antennae 27- to 30-jointed (South Africa) .... *asperulus* Silv.
    9b. Tergites nearly smooth. Antennae 23-jointed (South Africa) .... *laevigatus* Att.
  7b. Prosternal teeth of prehensors 10 + 10 or 11 + 11 (N.Z.) .... *validus* Arch.

Paralamyctes validus and *P. harrisi* are obviously very closely related, and it is not possible to fit them into the Key to the species given by Attems (Ann. S. Afr. Mus. 26, p. 67) and at the same time to indicate this relationship. Moreover, they present such a blend of characters that it is not easy to indicate their relationship to extra-Zelandic species. For instance, *P. humilis*, with only 2 + 2 prosternal teeth, has 35-43 antennal joints; but *P. chilensis*, which has only 19-20 antennal joints, has 5 + 5 prosternal teeth, while *P. validus* might be considered to be related to *P. spenceri* but for its smooth tergites and a tibial spur on the 15th leg. Moreover, the characters commonly used to distinguish the main species-groups of *Paralamyctes* are just those in which *P. validus* and *P. harrisi* (undoubtedly closely related species) differ.

In the South African species we do find a reduction in antennal segments associated with a reduction in the number of prosternal teeth; (*P. spenceri* and *P. weberi:* ant. 19-20, prost. 3 + 3 to 5 + 5, *vs. P. tabulinus* and *P. asperulus:* ant. 23-43, prost. 6 + 6 to 7 + 7), but in S. America the opposite condition is noted (*P. chilensis:* ant. 19-20, prost. 5 + 5, *vs. P. andinus:* ant. 23-24, prost. 2 + 2).

It is clear that much more information must be available about all the species of *Paralamyctes* before their genetic relationships can be determined.

Genus WAILAMYCTES Archey, 1916.

Type, by original designation: *Wailamyctes traillì* Archey.

Wailamyctes, Archey, Trans. N.Z. Inst., vol. 49, p. 311, 1916.
Wailamyctes, Attems, Ann. S. African Mus., vol. 26, p. 54 (in Key to genera), 1928.

Eyes absent, or a single ocellus on each side. Frontal sulcus distinct, median notch continued as a depression through sulcus nearly to middle of head. Antennae with 19 to 21 joints. Labrum (Pl. 21, fig. 6) unidentate, the lateral pieces with a fringe of hairs. Mandible (Pl. 21, figs. 7, 7a) with four complex cutting teeth, a set of plumose processes above them and a fringe of smaller simple hairs below. First pair of maxillae (Pl. 22, fig. 5) with the inner ramus not separated, and the outer incompletely separated from the coxa; inner ramus small, with a few simple hairs; outer ramus on inner edge with a row of longer plumose hairs and with numerous shorter simple hairs elsewhere. Palp of second maxillae 3-jointed, terminal segment with plumose hairs distally on the inner side and simple setae elsewhere; terminal claw complex. Prosternum of prehensors (Pl. 22, fig. 2) produced anteriorly, narrowing slightly, with straight or slightly curved dental edges separated by a median sulcus which continues to hinder margin, and armed with 4 + 4 to 6 + 6 conical teeth, of which the mesal one on each side is slightly smaller than the others.

Tergites (Pl. 22, fig. 1) with the posterior angles distinctly rounded and posterior margins straight, except in the posterior segments, where there is a slight emargination, and, in the minor tergites, a slight angular production. Spiracles on segments 1, 3, 5, 8, 10, 12 and 14. First to 12th pairs of legs with tarsi entire, 13th to 15th with tarsi biarticulate. Tibial spur on 1st to 13th or 1st to 14th legs. Coxal pores on the last four pairs of legs.

Key to Species.

Eyes absent .... *W. trailli* Archey
Eyes present:
  Larger, and with more slender legs: tarsus of 1st leg 8.7 times, of 8th leg 10 times, of 10th leg 10 to 11.5 times, and 1st tarsal joint of 14th leg 8 to 10 times longer than wide ...... *W. munroi* Archey
  Smaller, and with stouter legs: tarsus of 1st leg 6.5 times, of 8th leg 7.5 times, of 10th leg 9.3 times, and 1st tarsal joint of 14th leg 5.5 times longer than wide .... *W. halli* Archey

The species of *Wailamyctes* occur only in the South Island (Canterbury and Otago), Stewart Island and the Auckland Islands.

Wailamyctes trailli Archey (Pl. 21, figs. 6, 7; Pl. 22, figs. 1,2).

Wailamyctes trailli Archey, Trans. N.Z. Inst., vol. 49, p. 312, figs. 18-24; 1917.

Colour yellowish brown, in spirit straw colour.

Antennae with 21 joints, the first two large, followed by three smaller, the remainder still smaller. Head (Pl. 22, fig. 1) subcordate, the posterior margin slightly emarginate, angles broadly rounded, lateral and posterior margins with raised edge; eyes absent: frontal sulcus distinct, also a median longitudinal depression extending from anterior margin nearly to middle of head.

Tergites (fig. 1): anterior major tergites with broadly rounded posterior angles, a slightly emarginate hinder border; margins with a narrow raised edge; minor tergites with less broadly rounded angles and caudal margins lacking the raised edge The posterior major tergites with angles increasingly less rounded caudad, with caudal margins almost straight, and lacking raised border; the minor tergites more deeply emarginate and the angles somewhat produced.

Prosternum of prehensors (Pl. 22, fig. 2) produced narrowly anteriorly, the anterior margins almost straight and sloping inward, armed with 4 + 4 or 5 + 5 (occasionally 6 + 6) conical teeth, the inner mesal one on each side being slightly smaller.

Tarsi of 1st to 12th legs entire, of 13th to 15th biarticulate; tibial spurs long and sharp, on 1st to 13th legs. Tarsus of 1st leg 8.5 times longer than wide, of 8th leg 12.5 times, and first tarsal joint of 15th leg 10 to 12 times longer than wide. Coxal pores $\frac{2333}{2333}$; in smaller specimens $\frac{2323}{2323}$ or $\frac{2233}{2233}$; $\frac{1222}{1222}$ in a 7 mm. specimen. Gonopods of ♀ with long, slender, slightly curved sharp basal spurs and long, curved, sharp terminal claw.

Distribution: Canterbury, Westland, Otago and Stewart Island.

Wailamyctes halli Archey. Pl. 22, fig. 3.

Wailamyctes halli Archey, Trans. N.Z. Inst., vol. 49, p. 313, figs. 25-27. 1917.

Colour deep brown, paler in spirit. Antennae with 19 joints, the first two larger followed by three smaller, the remainder still smaller, the basal ones sparsely with long hairs, the distal ones with a light short pubescence.

Eyes present, head subcordate, notched medianly on anterior margin, caudal margin slightly emarginate; a raised border on caudal margin and on lateral margins behind the eyes. Frontal sulcus and median depression as in *W. trailli.*

Tergites with rounded corners, straight or slightly emarginate caudal margins, the margins with more strongly developed raised borders than in *W. trailli,* and the posterior minor tergites with angles not produced caudad.

Prosternum of prehensors narrowed anteriorly with dental margins slightly rounded, armed with 4 + 4 or 5 + 5 teeth. Coxal pores $\frac{2222}{2222}$ or $\frac{3333}{3333}$, in the latter case the inner or proximal pore on each coxa is smaller than its fellows. Gonopods of ♀ (Pl. 22, fig. 3) with long, slender, slightly curved basal spurs and long curved terminal claw. Legs 1-13 with tibial spur: first tarsal joint of 14th leg 5.5 times as long as wide; 15th pair of legs unknown.

Localities: Mt. Algidus (Rakaia Gorge, Canterbury); Minaret Peaks (Lake Wanaka, Otago).

Wailamyctes munroi Archey (Pl. 22, figs. 4 and 5).

Wailamyctes munroi Archey, Records Cant. Mus., vol. 2, pt. 3, p. 115. 1923.

Colour: above deep brown; head, first tergite and thirteenth to fifteenth tergites deeper reddish brown; ventral surface slightly lighter in corresponding regions.

Head rounded, posterior border margined and slightly emarginate. Antennae 19 joints, as in *W. halli.* A pair of large eyes present, frontal sulcus and median depression distinct as in *W. halli.*

Tergites with posterior angles rounded, and with posterior margins of anterior major tergites and of posterior major and minor tergites slightly emarginate, as in *W. halli.*

Prosternum of prehensors produced forward, narrowing anteriorly, the anterior margins inclined slightly inwards, slightly rounded and with 5 + 5 conical teeth, the inner being the smaller.

Legs: Tarsi of 1st to 12th uniarticulate, but 11 and 12 showing a ventral weakening of the chitin; tarsi of 13th to 15th distinctly biarticulate. Tibial spur on legs 1-14; tarsi slenderer than in *W. halli:* tarsus of 1st leg 8.7 times longer than wide, of 8th leg 10 times, of 10th leg 10 to 11.5 times, 1st tarsal joint of 14th leg 8 to 10 times, and 1st tarsal joint of 15th leg 11 times longer than wide.

Coxal pores $\frac{3333}{3333}$ on type and on two paratypes, $\frac{3433}{3433}$ on third paratype, the inner pore smaller than the others.

Gonopods of female (Pl. 22, fig. 4) of usual form, basal spurs short, straight and blunt, not long curved and sharp as in *W. halli;* terminal claw short and slightly curved, a distinct suture separating it from the joint. Gonopods of male unknown.

Locality: Summit of Hooker Hills (950 feet), Port Ross, Auckland Islands.

Genus HAASIELLA Pocock 1901.

Type, by monotypy: *Henicops insularis* Haase.

Haasiella Pocock, Ann. Mag. Nat. Hist., ser. 7, vol. 8, pp. 448, 449.

Ocelli a single pair. Prosternal teeth of prehensors 5 + 5. Posterior angles of tergites not toothed. Coxal pores reduced to one on each of last four pairs of legs. Fifteenth pair of legs much shorter than 14th and without protarsal segment.

Haasiella insularis (Haase) 1887.

Henicops insularis Haase, Abh. Zool. etc. Mus. Dresden, No. 5, p. 36, pl. iii., fig. 41, 1887. *Haasiella insularis,* Pocock, Ann. Mag. Nat. Hist., ser. 7, vol. 8, p. 449, 1901; Archey, Trans. N.Z. Inst., vol. 49, p. 316, 1917; Chamberlin, Bull. Mus. Comp. Zool., vol. 64, No. 1, p. 74, 1920; Archey, Trans. N.Z. Inst., vol. 53, p. 182, 1921; Attems, Ann. S. African Mus., vol. 26, p. 63, 1928.

Dull brown, head more reddish brown. Head as wide as the body, wider than long, with raised margins, hinder border slightly emarginate. Tergites with raised margins, the hinder ones less so; the minor tergites, also the 7th and 8th, straight behind, the 9th slightly emarginate. Prosternum of prehensors anteriorly narrowed with 5 + 5 teeth, claw strongly curved. Legs short, a single large coxal pore on the last four pairs of coxae. Tarsi indistinctly 2-jointed; 14th pair the longest, tarsus 3-jointed. The last leg consisting of only coxa, trochanter, femur, tibia and a long club-like tarsus and a thickened claw (metatarsal and claw combined). Male genitalia distinctly jointed and with a long terminal tapering process.

"Unfortunately the single specimen in the Dresden Museum (No. 15) brought by Herr Krone from the Auckland Islands is mutilated, lacking the antennae and the last leg of one side.

Thus it is not certain whether the peculiar form of the last leg is normal or the result of regeneration."—Haase.

This species differs from *Wailamyctes munroi* Archey only in the reduced number of coxal pores, the faint division of the 1st to 13th tarsi, and the remarkable form of the last pair of legs, and the possibility that it is an abnormal specimen of *W. munroi*, or rather that *W. munroi* is a normal specimen of *Haasiella insularis* should not be overlooked. If this should be established *Wailamyctes* would become a synonym of *Haasiella*, whose three species would be *H. insularis* (Haase), *H. trailli* (Archey) and *H. halli* (Archey).

Sub-family ANOPSOBIINAE.

Key to the Genera of ANOPSOBIINAE.

(Attems 1828, pp. 73-74.)

1a. Tarsi of all legs 1-jointed. Prefemur of last pair of legs not spined. Stigmata present on segments 3 and 10 .... *Catanopsobius* Silv. (Chile)

1b. Tarsi of legs 13-15, 2-jointed. Prefemur of last pair of legs with one strong spine. Three or more pairs of stigmata 2

2a. Stigmata present on segments, 3, 5, 8, 10, 12, 14. Tarsus 13, 2-jointed .... *Anopsobius* Silv. (S. America, S. Africa, New Zealand)

2b. Stigmata present on segments 3, 10, 12. Tarsus 13, 1-jointed 3

3a. Tarsus 13, 1-jointed .... *Dichelobius* Att. (Australia, New Caledonia)

3. Tarsus 13, 2-jointed .... *Tasmanobius* Chamb. (Tasmania)

Genus ANOPSOBIUS Silvestri (Pl. 23).

Type, by original designation: *Anopsobius productus* Silvestri.

1899 *Anopsobius* Silvestri, Rev. Chilena Hist. nat., vol. V., Pt. 3, p. 143.
1905 *Anopsobius* Silvestri, Zool. Jahrb., vi., p. 749.
1907 *Anopsobius* Verhoeff, Brown's Class. U. Ord., p. 235.
1909 *Anopsobius* Silvestri, Boll. Mus. Lab. Zool. Portici, IV., p. 40.
1917 *Anopsobius* Archey, Trans. N.Z. Inst., vol. 49, p. 316.
1928 *Anopsobius* Attems, Ann. S. Afr. Mus., vol. 26, p. 74.

Spiracles on segments 3, 5, 8, 10, 12, and 14. Antennae moniliform. Labrum (Pl. 23, fig. 2) free with unidentate median piece. Mandible (fig. 4) with four or five cutting teeth, also with long laciniate setae on anterior angle and with a tuft of short simple hairs on posterior angle. First pair of maxillae (fig. 3) with simple hairs only on the inner rami, and with simple and plumose on the outer. Second pair of maxillae (fig. 3) with 3-jointed palp, the terminal claw divided.

Prosternum of prehensors (fig. 5) with straight dentate edges armed with from 3 + 3 to 7 + 7 triangular teeth; claw and tarsus of telopodite fused, forming a tarsungulum.

Legs 1 to 12 with tibial spur and with uniarticulate tarsi; legs 13 to 15 without tibial spur and with tarsi biarticulate. Coxae of the 15th legs (fig. 8) and, to a less extent, of the 14th produced infero-posteriorly into an acute tooth; coxal pores on the last two pairs of legs. Last leg with an acute ventral spine on 3rd, and sometimes on 2nd joint of 15th leg.

Anopsobius neozelanicus Silvestri. Pl. 23, figs. 1-8.

Anopsobius neozelanicus Silvestri, Rend. R. Acc. Lincei, 18, p. 322, 1909; Silvestri, Boll. Lab. Zool. Portici, vol. 4, p. 45, figs. 1-5, 1909; Archey, Trans. N.Z. Inst., vol. 49, p. 316, figs. 37-40, 1917; Chamberlin, Bull. Mus. Comp. Zool., vol. 64, No. 1, p. 75, 1920; Archey, Rec. Cant. Mus., vol. 3, pt. 1, p. 40, 1926; Attems, Ann. S. Afr. Mus., vol. 26, p. 77, 1928.

Colour pale yellowish brown, head and last two segments slightly darker.

Antennal joints almost constantly 15, variations such as 15 on one antenna and 14 on the other, or 14-17, occurring very occasionally on larger specimens. Tergites (fig. 1) with posterior angles rounded; and with hinder margins with a raised border, which in posterior segments is somewhat removed from the actual edge.

Prosternum of prehensors (fig. 5) with the dentate edges inclined inwards and armed with from 3 + 3 (in immature forms) to 7 + 7 teeth, most commonly in mature forms with 5 + 5 or 6 + 6; claw of telopod incompletely separated from tarsus. First maxillae (fig. 3) with the coxae incompletely separated; inner ramus not separated from coxosternum by a suture, armed with four simple hairs; outer ramus separated from coxosternum, of two joints, its inner edge with a marginal fringe of long plumose setae and a submarginal fringe of fewer simple setae. Second maxillae (fig. 3) with 3-segmented palp; the inferodistal angle of the second joint produced into a short acute spine; the third joint with simple hairs only, lacking the plumose hairs of *A. patagonicus calcaratus* Attems (1928, p. 74); the terminal armament a group of three slender, curved, sharp spines.

Coxal pores from $\frac{1-1}{1-1}$ in small individuals to $\frac{3-3}{3-3}$ in larger specimens; on the average there are more coxal pores in females than in males of the same size; but this condition is not so marked as in other genera.

Gonopods of ♂ (fig. 8) slender 3-jointed styles; of ♀ (fig. 7) of the usual form with 2 + 2 basal spurs; but in small individuals the gonopods are undeveloped to the extent of having the basal joints relatively smaller and armed only with 1 + 1 basal spurs (fig. 6).

In an earlier paper (1926, p. 40) I noted that the 15th legs of males were relatively longer and slenderer than those of females; but now, after examination and measurement of a much greater number of specimens, I am able to say that this does not hold, and that on the contrary the proportion length÷breadth of the joints of the legs is extremely variable. This may be, to a considerable extent, an actual variation in the normal proportions of the joints; but it is also undoubtedly partly an expression of the degree of contraction of the individual specimen. These variations in the length÷breadth ratio of one joint range evenly from 4.6 to 10.0. It may seem trivial to record these slight differences; but, as species have, in other genera, been founded on such differences it is necessary that their inconstancy and general unreliability should be emphasized.

Distribution: Both islands; commoner and more widely distributed in the South Island, especially in relation to the Southern Beech Forest *(Nothofagus).*

Order SCUTIGEROMORPHA.

There is only one species of this order to record from New Zealand, and the detail in which it is described hereunder may appear to be excessive. The characters on which the differentiation of species and genera have, however, not been finally settled, notwithstanding Verhoeff's extended and important studies, and it seemed desirable therefore to record full details of the New Zealand species as a contribution towards the estimation of the relative value of the characters hitherto relied upon. I desire, moreover, to submit a suggestion as to the classification of the order.

The various attempts to set out the degrees of relationship between the genera of the Scutigeromorpha have resulted in different grouping under headings of varying relative importance. The two most recent arrangements are those of Verhoeff (1905, p. 75) and Attems (1926, p. 394), both of which agree in the sub-divisions adopted, though differing in the denomination of them.

Attems' system, which accepts Verhoeff's final subdivision of the genera of the largest family *(Scutigeridae)* into two groups by means of the presence or absence of distal protarsal spinous processes, does not name these groups, and as they are so well founded, and it would be advantageous to have them designated, I suggest the following subdivision of the order. The use of the term "Super-family" for the main subdivision avoids the suggestion that the characters separating them are in any way comparable in importance with those separating the "under-orders" and sub-orders of the Lithobiomorpha.

Order SCUTIGEROMORPHA.

- Super-family 1. Scutigeroidae.
  - Family 1. Scutigeridae.
    - Sub-fam. 1. Scutigerinae.
      - *Scutigera, Ballonema, Lassophora, Diplacrophor*
    - Sub-fam. 2. Thereuoneminae.
      - *Thereuonema, Tachythereua Allothereua, Parascutigera, Prionopodella Thereuopoda, Thereuopodina, Prothereua, Podothereua*
  - Family 2. Pselliophoridae.
    - *Pselliophora, Sphendononema*
- Super-family 2. Scutigerinoidae.
  - Family Scutigerinidae.
    - *Scutigerina*

The adoption of these group designations will allow us to follow Attems' "Key to the Scutigeromorpha" (1926, p. 394), and at the same time to give a suitable name to each of his divisions.

Order SCUTIGEROMORPHA.

I. Gonopods of ♀ slender styles. Longitudinal ridges on prefemur femur and tibia of all legs .... Super-fam. 1. *Scutigeroidae*
  1. Antennal segments much broader than long; both pairs of ♂ gonopods cone- or style-shaped .... Family 1. *Scutigeridae*
    i. 6th-14th legs with 2 distal tarsal spinous processes ...... Sub-fam. 1. *Scutigerinae*
    ii. Legs without distal tarsal spinous processes .... Sub-fam. 2. *Thereuoneminae*
  2. Antennal segments as long as or longer than broad. Gonopods of ♂ plate-like, widened and medianly fused. .Family 2. *Pselliophoridae*

II. Gonopods of ♀ flat, blunt, hairy cones. Legs without longitudinal ridges . . Super-fam. 2. *Scutigerinoidae*

Only one family: *Scutigerinidae.*

The nomenclatural difficulty inherent in the similarity of names *(Scutigera* and *Scutigerina)* of the type genera of the two main sections, remains in this classification; but shortening or modifying the family or sub-family names, as suggested by Attems, does not obviate it any more successfully than a strict application of the accepted rules for the endings of these group names. If, for instance, further subdivisions of the super family Scutigerinoidae are required, the family and sub-family designations *Scutigerinidae* and *Scutigerininae* will be readily differentiated from *Scutigeridae* and *Scutigerinae.*

Family **SCUTIGERIDAE.**

Sub-family SCUTIGERINAE.

Key showing position of the genus SCUTIGERA.

1. Protarsus of 6th to 14th legs with two terminal spines.
   Tergites without spines: legs 1-14 with tarsal pegs .... *Ballonema* Verh.
   Tergites with spines: legs 1 to 6-9, sometimes even 1 to 6 with tarsal pegs ..... *Scutigera* Lam.
2. Protarsus of legs without terminal spines . . *Allotheurea* Verh. (Australia)

Genus SCUTIGERA Lamarck 1801.

Scutigera Lamarck, Syst. Anim., p. 182, 1801.

Tergites with scattered minute spines on upper surface and on margins. Tarsal pegs present, of equal size; on some tarsi, segments with pegs alternate with segments without them, but on some of the anterior legs peg-bearing segments may be consecutive.

The ♂ gonopods of both segments (pregenital and genital) are slender styles. Joints of the antennae much broader than long.

Scutigera smithii (Newport). Pl. 24, figs. 1-8.

Cermatia smithii Newport; Ann. Mag. Nat. Hist., 13, p. 96, 1844.
Allothereua (?) smithii, Chamberlin, Bull. Mus. Comp. Zool. 64, No. 1, p. 80, 1920.

Head (Pl. 24, fig. 1) sub-rectangular in outline with broadly rounded angles, the hinder border and the lateral borders behind the eye with a narrow raised margin. The basal antennal joint with 58 to 64 joints (in two specimens; but a larger specimen, 27 mm. long, had 100 joints through suppression of the Node—see Verhoeff 1925, p. 5). Mandibles and maxillae of the customary *Scutigera* form. Telopodite of second maxillae (fig. 7): prefemur sparsely with short fine setae and two long socketed processes which have a sparse covering of minute setae; femur with large and small setae, the former in rows, and with four long processes; tibia with two processes, smaller than on the femur and with fewer large and small setae; tarsus indistinctly tripartite, with large and small setae.

Prehensors (fig. 2) with four very long curved prosternal setae, these much longer than in other species, e.g. *S. coleoptrata.*

Tergites sparsely with short fine setae, more numerous on the caudal and sub-caudal margins than on the upper surface. To these are added, from the third segment on, stouter spines, each of which usually arises close to one of the simple setae (cf. *Allothereua maculata* (Newp.), in Brolemann, Rec. Aust. Mus. 9, p. 40, 1912), and which increase in number, both on the upper surface and the hinder margin in the posterior segments until the 7th; on the 8th there are very few. Terminal tergite with numerous long slender setae and a pubescence of shorter finer setae.

Sternites sparsely with slightly longer setae, these increasing in length and number in the hinder segments.

Anal sternite.

Male and female (fig. 8) genital appendages of usual *Scutigera* form.

In describing the legs one has to distinguish three types of armature: (a) large, socketed, movable **spinous processes** (fig. 3, *sp.p),* (b) short, stout, unsocketed **spines** (fig. 3, *sp.),* and (c) **simple setae** with unsocketed base (fig. 3, *st.).*

The **spinous processes** occur on most of the legs as follows: on the **prefemur** (fig. 3) a large ventral process and two dorso-terminal, i.e., one on posterior and one on anterior side. The **femur** (fig. 4) has one dorsal and two latero-terminal (one on each side), while the **tibia** has four spines terminally (a dorso-terminal and a ventro-terminal on each side).

With regard to the **spines** and **setae** we find that on the anterior legs (1st to 4th) there are for the most part only setae, although a few spines may appear on the rows of setae on the posterior side. These spines steadily increase in number on succeeding legs, and begin to appear on the anterior side of joints from the 4th or 5th legs until by the 9th and 10th there are as many spines as setae.

Tarsal pegs (fig. 6, *tp.)* are present in the specimen on which this description is based on the 1st to the 6th legs (in other specimens on 1st to 7th) as follows: 1st leg: right 9 pegs left 8 pegs; 2nd, 10 and 9; 3rd, 7 and 8; 4th, 2 and 6; 5th, 4 and 1; 6th, 3 and 1. As the tarsal pegs become fewer a distal **protarsal spine** (really a spinous process) appears, on the anterior side only, on 5th and 6th legs, and on both sides from the 7th leg to the 14th. Similarly, smaller spines appear on the posterior side of the protarsal segments from the 6th leg, becoming more numerous and appearing on more segments on the more posterior legs, while from the 11th leg they are present on the anterior side also.

The number of tarsal joints varies, usually differing in right and left legs of a pair. The number ranges from 45 in the 1st and 14th legs to 32 and 33 in those of the middle region of the body; there are also relatively more protarsal joints in the anterior legs, i.e., the 1st has 15+30=45, while the 14th has 9+36=45.

The above description is based on the examination of one specimen, but the leg-armature differs from it considerably in other specimens examined. I have prepared several tables setting out the distribution of spines and tarsal pegs in different specimens, but the variations they reveal, or, rather, the lack of definite arrangement they disclose, make it not worth-while to reproduce more than one, which suffices to show the irregularity of the distribution of the pegs and the abrupt displacement of tarsal pegs by protarsal spines at the 6th leg.

Table showing distribution of spines and tarsal pegs in three specimens of *Scutigera smithii* (Newport): (a) Auckland, Dec. 1926 (L. T. Griffin); (b) Auckland, Mar., 1927 (G.A.); (c) Thames, Oct., 1934 (G. Woods).

Tarsal pegs thus••• Protarsal spines 3, 1, 7, etc. (next page).

Nº. OF TARSAL AND PRO-TARSAL JOINTS			PRO-TARSAL JOINTS																											
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1. *a*	L.	13 + 28									●	●	●		●		●		●		●		●		●					
b	L.	15 + 30										●		●	●	●				●		●			●			●		
	R.	14 + 31									●	●	●	●		●		●		●		●			●					
c	L.	14 + 30									●		●		●		●		●		●		●		●					
	R.										●	●	●		●		●		●		●		●		●					
2. *a*	L.	13 + 27									●		●		●		●		●		●		●							
b	L.	14 + 31												●	●	●	●			●	●		●		●			●		
	R.	13 + 28								●	●	●	●	●		●		●		●		●		●						
c	L.	13 + BROKEN									●		●		●		●		●		●		?		?		BR	OK	EN	
	R.	13 + 29											●		●		●		●		●		●		●					
3. *a*	L.	10 + 29								●		●		●		●		●		●		●		●		●				
b	L.	12 + 27								●	●	●	●		●		●		●		●									
	R.	12 + 29												●		●		●		●		●		●		●				
c	L.	12 + 28								●		●		●		●		●		●		●		●						
	R.	12 + 28								●		●		●		●		●		●		●		●						
4. *a*	L.	11 + 26						●		●		●		●		●		●		●		●		●						
b	L.	11 + 26											●	●	●	●				●		●								
	R.	10 + 21															●		●											
c	L.	9 + 29											●	●	●		●		●		●		●		●					
	R.	10 + 27									●		●		●		●		●		●		●							
5. *a*	L.	9 + 25							●		●		●		●		●		●		●									
b	L.	9 + 25																		●										
	R.	10 + 25												●	●		●		●											
c	L.	9 + 26									●		●		●		●	●	●		●		●							
	R.	8 + 28											●		●		●		●		●		●							
6. *a*	L.	7 + 24								●		●		●		●		●		●										
b	L.	10 + 22	3	1															●											
	R.	8 + 26	3																		●	●		●						
c	L.	8 + 25	2											●		●				●		●								
	R.	8 + 26	3										●		●		●		●		●		●							
7. *a*	L.	8 + 23											●		●		●													
b	L.	9 + 25	5	1	1																									
	R.	9 + 26	5	1	1									N	I	L														
c	L.	BROKEN	4	1										B	R	O	K	E	N											
	R.	7 + 27	4	0	1	1					●				●		●				●		●							
8. *a*	L.	7 + 25	6	1	1									N	I	L														
b	L.	7 + 25	7	1	2																									
	R.	8 + 27	8	2	2	1								N	I	L														
c	L.	8 + 27	6	1	1															●		●		●						
	R.	8 + 25	7	1	1													●		●										
9. *a*	L.	7 + 25	7	1	1									N	I	L														
b	L.	8 + 25	10	1	3	0	1																							
	R.	7 + 29	11	3	2	1	1							N	I	L														
c	L.	7 + 26	7	1	1	1															●		●							
	R.	7 + 27	6	1	1	1														●		●		●						
10. *a*	L.	7 + 26	8	2	1	1																								
b	L.	9 + 26	13	2	3	1	2	1																						
	R.	10 + 27	14	2	2	2	1	1	1	1																				
c	L.	7 + 29	8	3	3	1	1																							
	R.	8 + 26	10	1	1	1	1																							
11. *a*	L.	8 + 25	9	1	1																									
b	L.	7 + 27	15	2	2	1	1																							
	R.	7 + 28	15	3	3	2	2	1																						
c	L.																													
	R.	8 + 29	10	1	1	1	0	1																						
12. *a*	L.	6 + 27	9	1	2	1																								
b	L.	8 + 30	18	3	2	2	1	1																						
	R.	8 + 30	25	3	3	2	1	1																						
c	L.	8 + 29	14	1	1	1	1																							
	R.	7 + 28	12	2	1	1	1																							
13. *a*	L.	7 + 27	9	1	1	1																								
b	L.	8 + 31	16	3	2	2	1	1	1																					
	R.	8 + 32	8	1	2	1	1	1																						
c	L.																													
	R.	8 + 30	15	2	2	1	1	1																						
14. *a*	L.	9 + 36	12	1	1	2	1	1																						
b	L.	9 + 35	24	3	2	1	1	1																						
	R.	9 + 25	19	3	3	2	2	1	1																					
c	L.	×																												
	R.																													

Several species of *Scutigera*, European, Asiatic and African, have been described by Verhoeff (1906, pp. 76 *et seq)* who has relied for their establishment chiefly on variations in the armature of spines and tarsal pegs on the legs. Attems (1928, p. 40) has expressed doubt as to the value of these characters for the determination of species and subspecies, and the amount of variation I have found in five specimens all taken from the one spot in Auckland city, emphasizes his doubts.

The genera *Scutigera* and *Lassophora* are separated by Attems (1928, p. 38, Key to genera) on the basis of the former's possession of joints with pegs of equal size alternating with joints without pegs, and the latter's possession of alternating large and small pegs. *Sc. smithii* has pegs of equal size throughout, but they are very irregular as to their distribution. It seems, however, undesirable to erect a new genus on account of the **slight** reduction in the number of legs bearing pegs and the iregular arrangement of the pegs themselves.

Scutigera smithii belongs to the group in Verhoeff's classification (1905, p. 76) of species, e.g., *S. muscivora*, having a restricted number (65-78) of joints in the first flagellum and having the tarsal pegs restricted to the first 8 or 9 legs. The number of protarsal and tarsal joints is approximately the same in the two species, but is very variable in *S. smithii*, being considerably different even between legs of the same pair. *S. smithii* also has considerably fewer small spines on the protarsal joints, particularly on the first joint, i.e.,

	muscivora.	*smithii.*
7th leg ..	11+1+2	5+1+1
8th leg ..	16+2+2	8+2+2+1+1
9th leg ..	18+1+1+2+1	11+2+2+1+1

It is rather surprising to find a species of *Scutigera* in New Zealand, for it is far out of the normal range not only of the genus, but also of the sub-family *Scutigerinae*. One would have expected instead to have found a species of the sub-family *Thereuoneminae*, which is the only sub-family found in Australia, and is strongly represented there (Verhoeff, 1925).

This anomalous occurrence, together with the fact that the species seems to be restricted to the environs of Auckland City, our chief overseas port, leads one to suspect that it may be an introduced species, but against this supposition is the fact that it cannot be referred to any other known species.

This centipede appears to be fairly common about Auckland City, specimens not infrequently being sent to the Museum for identification—unfortunately invariably in a badly damaged condition, and I have had to rely for study on five specimens taken by myself in the old Auckland Museum building. They run with amazing speed and are very difficult to capture.

GENERAL.

(a) Variable Characters.
(b) Distribution.
(c) Zoo-geographical Relations.

(a) Variable Characters.

In making this revision it was found necessary to determine to what extent certain characters could be relied upon to differentiate species, and, as mentioned in the introduction (p. 43), a tabulated record of characters from the large number of specimens I have been able to examine, has shown some of them to be sex and age characters, and others to be related to climatic conditions. Several species therefore, previously described both by the writer and others on the basis of these variable characters, have now been merged with earlier named species, and the total number of New Zealand species has been reduced from 64 to 37.

The stoutness or slenderness of the leg-joints (i.e., the proportion length:breadth) is a character that should be used with caution, and only wide differences should be relied upon. Considerable variation in leg-proportion can certainly be observed, but it is continuous variation, and is for the most part only the effect of muscular contraction or relaxing on elastic chitin. The proportions of the cephalic plate and prosternum of prehensors may vary through the same causes.

Variation also occurs in the number of tarsal subdivisions. In *Henicops maculatus,* which normally has, in the 14th leg, a protarsus of 2 segments and a tarsus of 4, there may be 2 + 3 or 3 + 3, and the 13th, which is normally triarticulate, may have 2 + 2 or even 3 + 3. Similarly the tibial spur, which in *Lamyctes emarginatus* is usually present on legs 1 to 11, is sometimes present on 1 to 12, rarely on 1 to 13 or even on 1 to 14, while in *Paralamyctes* the spur of the 15th leg may be reduced to a low, scarcely discernible eminence. Similar variations occur in *Anopsobius,* but I have had too few specimens of *Wailamyctes* to enable me to record its range of variability.

The broad, densely pubescent anal legs of male geophilids have previously been noted by students; comparable sex differences in Cryptops (Archey, 1924, pp. 205-208) are long, moderately ecto-ventral setae on the anal legs of females, and a short, dense pubescence extending to the ante-penultimate legs in males. Mature males also have a strongly developed keel on the first tarsal joint of the anal legs, and possess a large number of small tibial teeth in two or four rows instead of the single row of fewer and larger teeth found in females

Coxopleural pores definitely increase in number according to the increased size and, presumably, the greater age of individuals in a species, and this condition has proved equally constant in the three groups (Lithobiomorpha, Cryptopidae, and Geophilomorpha) in which sufficient specimens were available for study. It was also found, in all three groups, that the pores are larger and more numerous in females than in males of equal size.

From the descriptions of the Geophilomorpha in Part 1 it may be observed that, in a genus, the species with the largest number of segments has a larger coxopleure and a greater number of pores, and also that these connected characters are related to the humidity of the area of distribution of the species concerned.

In *Zelanion,* for instance, *Z. antipodus,* with 39-41 segments and with numerous coxal pores on the ventral surface only, ranges the whole country; *Z. morbosus,* also with 39-41 segments, but with the pores reduced to a few lying under the edge of the sternite, is restricted to South Wellington (where it is rare) and the drier eastern side of the South Island; *Z. dux,* however, with 49-53 segments and numerous coxal pores on both dorsal and ventral surfaces, is common in the North Island and is found in the South Island only on the more humid western side.

In *Geophilus* two species are South Island only; of these *G. spenceri,* with 39 segments, has a moderate number of pores both above and below, while *G. zygethus,* with 47-65 segments, has numerous pores both above and below. Only *G. xylophagus* occurs in both islands, and is coastal in distribution; its few pores are contained within a depression or pocket near the edge of the sternite, and it is interesting to note here that the only other New Zealand geophilids which are coastal in distribution and are sometimes found in intertidal zones (species of *Maoriella)* have the pores or pore-groups in a similar depression.

In the Cryptopidae, in which the number of segments is fixed, we again find that the species inhabiting the more humid areas *(C. lamprethus* and *C. polydontus)* are larger and have numerous coxopleural pores, while those inhabiting a drier region *(C. dilagus* and *C. australis)* are smaller and have fewer pores (Archey, 1924, pp. 206-7).

It will thus be seen that, while the coxopleural pores, like leg-joint proportions and tarsal sub-divisions are variable and in some respects are sex and age characters, their definite relation to a climatic condition increases their value as diagnostic characters in that a character-fixing factor is added to geographical distribution or areal isolation.

(b) **Distribution.**

As might be expected, the fast-moving Lithobiomorpha, to whose mobility is added tolerance of a considerable variety of situation (from damp forest to open grassland), are of widest general distribution, and there are more Lithobiids commonly distributed over both islands than Geophilids or Cryptopids. Using the term "general species" for such widely distributed forms, we may record *Henicops maculatus* and *Anopsobius neozelanicus* as such. *Lamyctes* has a general species *(L. emarginatus)* and one restricted to the South Island *(L. oticus),* while *Paralamyctes,* also with a general species *(P. validus)* has a restricted North Island form *(P. harrisi).* *Wailamyctes* is South Island only.

The species of Geophilomorpha are less widely distributed. There is only one general species *(Zelanion antipodus)*; the remainder are either confined to one island or to a climatic or zoogeographic zone such as the Wellington-Western South Island region, or are coastal in their distribution (both *Geophilus xylophagus* and *Maoriella macrostigma* are coastal and intertidal).

In the distribution of species both of *Zelanion* and *Cryptops* the well-established separate connections between Wellington and western South Island on the one hand and Wellington-eastern South Island on the other hand appear. *Zelanion dux* and *Cryptops spinipes* are North Island-Westland species, while *Zelanion morbosus* and *Cryptops dilagus* connect with eastern South Island. The greater age and zoo-geographical importance of the mountain axis barrier than that provided by Cook Strait has been previously indicated in other zoological groups (Chilton 1889, Archey 1915, Powell 1930). The Chatham Islands (Archey 1926) have only general species or those which are otherwise restricted to the North Island. They share no species exclusively with the South Island, and their chilopod relationships are clearly North Island.

The definite relationship between the number of segments and coxal pores on the one hand and climatic conditions in different districts on the other has already been noted and, finally, mention may be made of the rarity of extremely long forms—*Maoriella aucklandica* and *Zelanophilus ferrugineus*, the former known from only one specimen and the latter from two. I myself have collected in every part of New Zealand and have failed to secure either, and have wondered whether they might be examples of some rare aberrant or mutant phase of metamerism.

(c) Zoo-Geographical Relationships.

The New Zealand chilopod fauna is closely related to that of southern Australia, of which it is a pale shadow. Southern Australia is emphasized because Australia has several centipedes of northern affinities which are absent from the New Zealand fauna.

Of the ten families into which the Geophilomorpha are usually divided, only two are represented in New Zealand, and the absence of certain families is as interesting and significant as the distribution of the species of the two families which do occur here.

Five of the geophilomorph families are confined to the northern hemisphere or are of very restricted distribution, and their absence from New Zealand is of no special significance. More important, however, is the absence of the family Oryidae, which occurs in the Mediterranean, Africa, the Neotropical region and extends into Australia and the South Pacific (Solomon Islands, Fiji, and the Cook Islands). Similarly the Mecistocephalidae, which are widely distributed in the northern hemisphere, India, East Indies, Philippine Islands, Australia (chiefly northern), Melanesia, New Caledonia, Fiji and Tahiti, are absent from New Zealand. Of the Schendylidae we find that the sub-family Schendylinae, which occurs in the northern hemisphere, South America, New Caledonia and Fiji, does not appear in Australia or New Zealand; while the sub-family Ballophilinae, which has much the same distribution, has only one New Zealand representative, *Ballophilus hounselli,* which stands near to *B. australiae* from Australia.

So far, therefore, we see that families which are mainly northern in their distribution with Indonesian and south-tropical Pacific outliers, are represented but little in Australia, and in New Zealand by a single species, one with Australian affinities. On the other hand we find that, in the great family Geophilidae of world wide distribution, most of the New Zealand species occur within the closely related sub-families Geophilinae and Pachymerinae These two sub-families are also well represented in all parts of Australia, **but not at all in the islands of the south-tropical Pacific.**

Of the five New Zealand genera of the Geophilidae, only one *(Zelanophilus)* is endemic, the others having species in Western Australia, Victoria and Tasmania *(Zelanion),* in Tasmania *(Maoriella)* and in Australia generally *(Geophilus* and *Schizoribautia),* while four species *(Geophilus zygethus, Zelanion, antipodus, Z. morbosus* and *Maoriella macrostigma)* occur in both Australia and New Zealand.

In passing it may be noted that two of the New Zealand species of *Geophilus* occur only in the South Island, and the other is coastal, that *Zelanophilus* is found only in the South Island and Wellington, and that while both genera of Pachymerinae occur throughout New Zealand neither of them has relationships north of New Zealand.

In brief, the affinities of New Zealand Geophilomorpha are distinctly Australian, and more especially southern Australian. They are definitely not sub-equatorial Pacific, only one species, *Ballophilus hounselli,* being possibly referable to an Australo-West Pacific element in the fauna.

In the other orders also, the affinities are strongly southern. Of Scolopendromorpha, only species of the widely distributed genera *Cormocephalus* and *Cryptops* occur, while the unique species of Craterostigmomorpha is shared between Tasmania and the South Island of New Zealand. Of the Lithobiomorpha, the world-wide genera *Lithobius* and *Lamyctes* are present; the other genera are all of southern affinities. *Henicops* is Neozelanic and Australian only; *Wailamyctes* and *Haasiella* are endemic; *Walesobius* inhabits South Africa, Australia and New Zealand, while *Paralamyctes* and *Anopsobius* occur in South America, South Africa, Australia, New Zealand and New Caledonia.

Attems (1928, p. 13), dealing with chilopod genera that South Africa, South America and Australia have in common, refers as follows to explanations of these distributions put forward by other workers. "The partisans of the theory that continents were formerly connected with each other will find the distribution of the first-named three genera [*Paralamyctes, Eurytion* and *Aphilodon*] to be a further proof for a Brazilo-African continent. But I think one can explain the wide distribution without taking refuge in the fantastic theory above mentioned, as already stated in Kükenthal's Handbuch der Zoologie. I suppose that the said genera originated somewhere in the big curve South Africa-East Africa-India-East Asia, and have eventually spread as far as the utmost ends of this curve (South Africa, South America, South Australia), while perhaps already in the course of their spreading they died out in parts of this curve for climatical or other reasons." He then compares this broken distribution with that of certain insects (whose special powers of spreading should not be overlooked); he mentions the lack of fossil evidence, rightly emphasizing the importance of this lack; and finally rather briefly dismisses the theory of continental land bridges, "of which there are no traces in geology, and which were only postulated to account for the distribution of animals."

Attems' postulated route of distribution, however, crosses present tracts of ocean, and suggests a spreading across a continuous land surface subsequently broken in the manner outlined in Wegener's drift hypothesis. If, moreover, we are able to explain the present distribution of terrestrial animals in no other way, we shall still have to postulate the existence of former land bridges; but not necessarily in this instance of a **direct** Brazilo-African connection.

There exists a large Antarctic continent, which formerly had a mild climate and which, e.g. in Graham Land, even now approximates geographically, geologically, and to a limited extent faunistically, to the southern extremity of South America, and the conclusion to which most students of the flora and fauna of austral countries have been led is that land connections from Antarctica have, at different times, reached South America, South Africa, Australia and New Zealand (Benham, 1903, 1909; Chilton, 1909; Hedley, 1895; Earland, 1934; to mention only a few among many references).

It is not possible here to quote this evidence at length: briefly it emphasizes that explanation has to be made, not only of the presence of certain genera in southern continents, but the existence of whole families which are well marked off from northern hemisphere families and whose purely austral occurrence clearly indicates a southern origin and distribution. A considerable element in the flora and fauna of every southern land finds its relationships only in other southern lands, and is entirely without northern representatives. In fact, as Hedley (1895) has shown, the relationships are strongest in the south and diminish towards the north, which is directly opposite to what would be expected if these elements had spread from a northern centre. Recently, moreover, Earland (1934) has shown that the former existence of a **land barrier** (connecting Antarctica and South America) offers the best explanation of the **differences** between the foraminiferan fauna of the Bellinghausen and Weddel Seas.

The zoo-geographical relationships of the New Zealand chilopoda are of this distinctively southern type. The fauna includes, besides the endemic genera *Wailamyctes* and *Haasiella*, (a) a restricted Australo-Zelanic element *(Henicops, Zelanion* and *Maoriella)* and (b) genera of wider, but still purely austral relationships *(Walesobius, Paralamyctes, Anopsobius* and *Schizoribautia)*. An interesting feature of this distribution is that although south-tropical Pacific genera have not reached New Zealand, three essentially southern genera *(Paralamyctes, Anopsobius* and *Schizoribautia)* have reached New Caledonia, an island which, however, has other well-known faunistic relationship (e.g. *Plactostylus)* with New Zealand.

Before concluding this long deferred and much interrupted study, I wish to thank those friends who have sent me specimens from many parts of New Zealand, and particularly to Mr. W. Hounsell, Captain E. J. Cullen, Mr. S. Lindsay and Mr. Charles E. Clarke, for their assiduous collecting for me. I am also indebted to Professor R. Speight for many opportunities of collecting and study, and to Professor W. B. Benham and the Directors of the British Natural History Museum, the Australian Museum and the Museum of Comparative Zoology for facilities for studying types and other important material.

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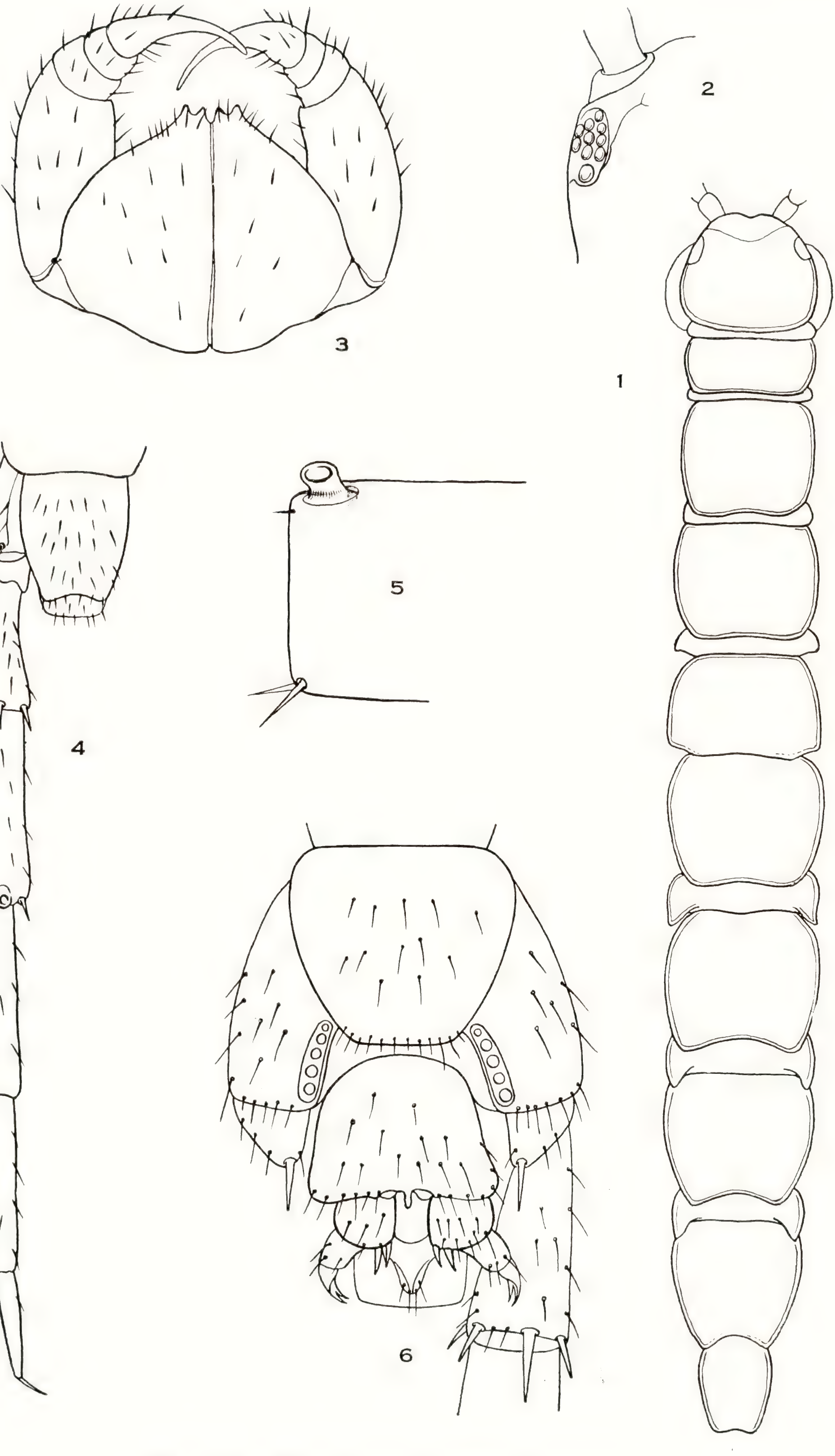
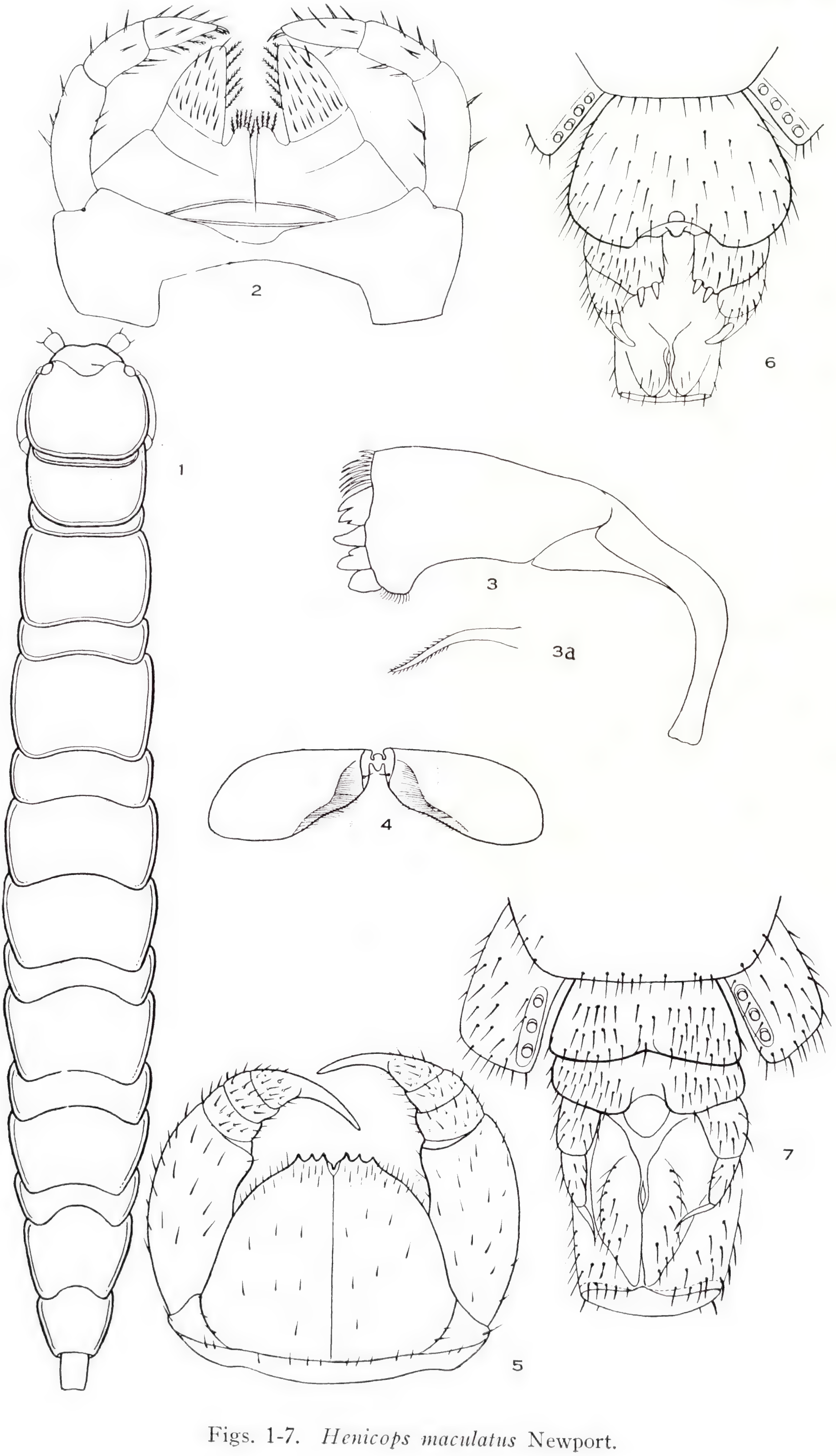
PLATE 16.



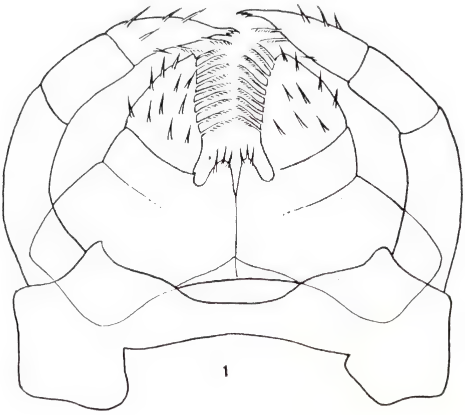
Figs. 1-6. *Walesobius sydneyensis* (Pocock).

Plate 17.



Figs. 1-7. *Henicops maculatus* Newport.

PLATE 18.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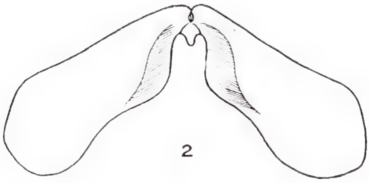
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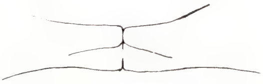
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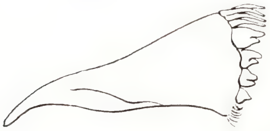
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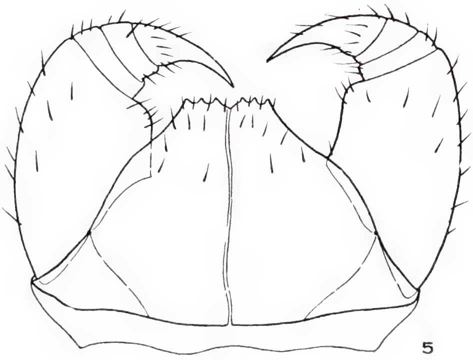
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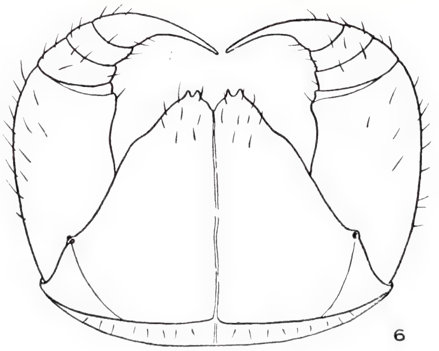
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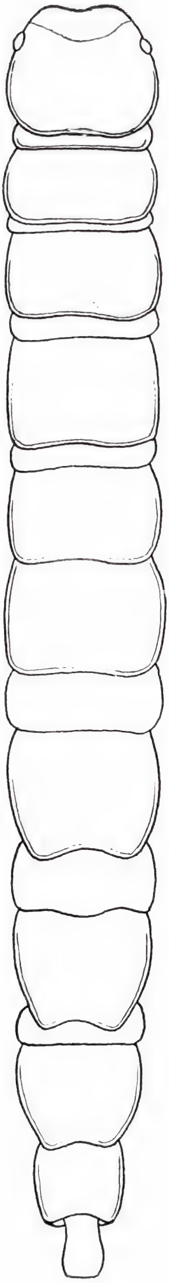
Figs. 1, 2, 4 & 6. *Lamyctes emarginatus* (Newport).
Figs. 3 & 5. *Lamyctes oticus* Archey.

PLATE 19.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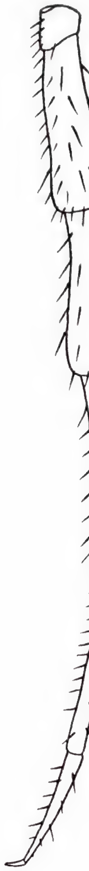
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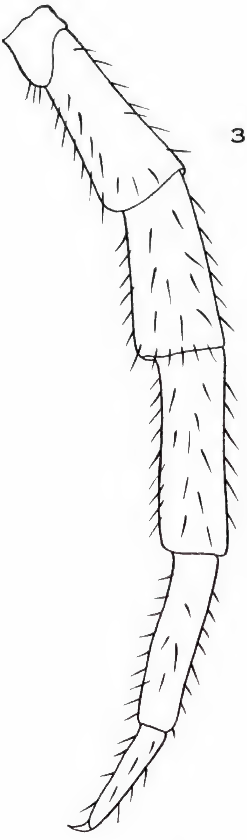
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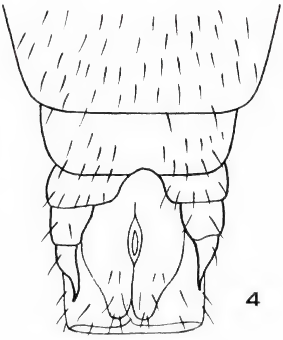
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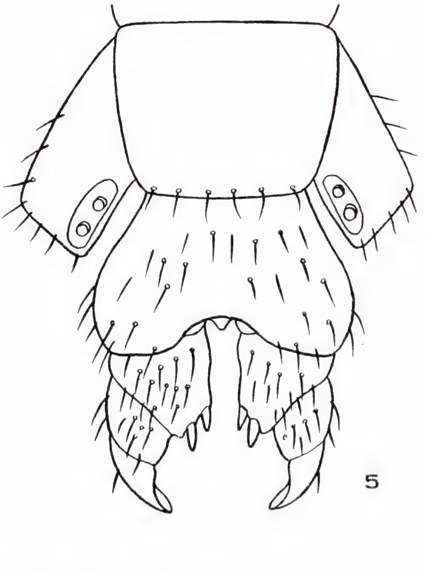
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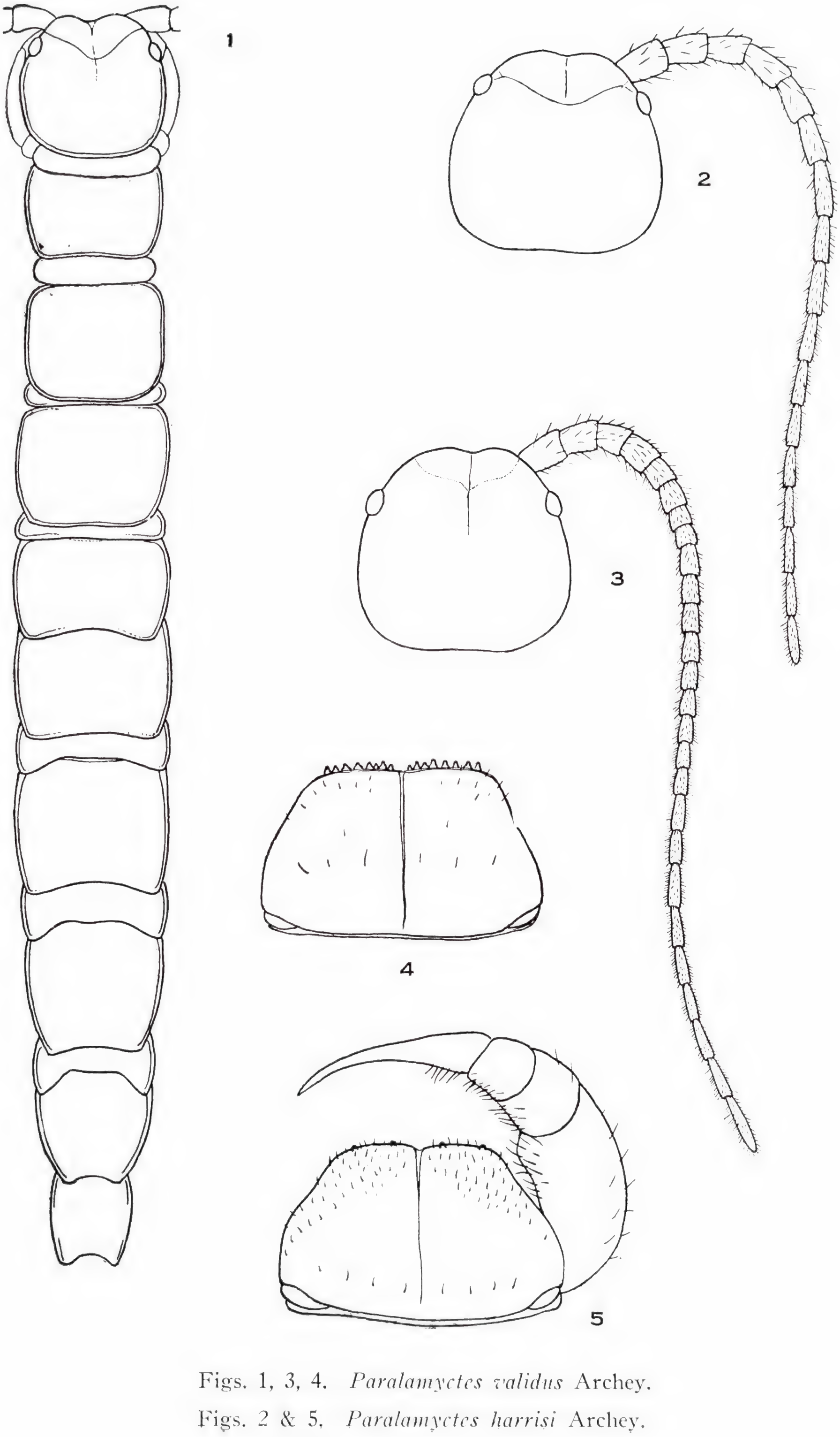
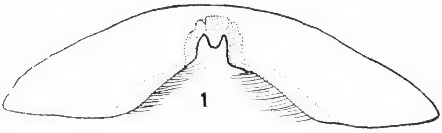
Figs. 1, 2, 4 & 5. *Lamyctes emarginatus* (Newport).

Fig. 3. *Lamyctes oticus* Archey.



Figs. 1, 3, 4. *Paralamyctes validus* Archey.

Figs. 2 & 5. *Paralamyctes harrisi* Archey.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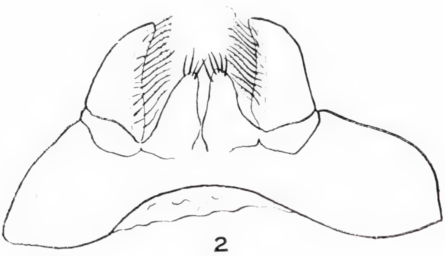
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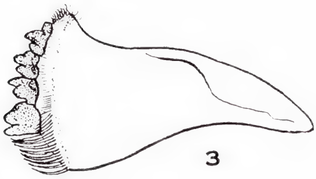
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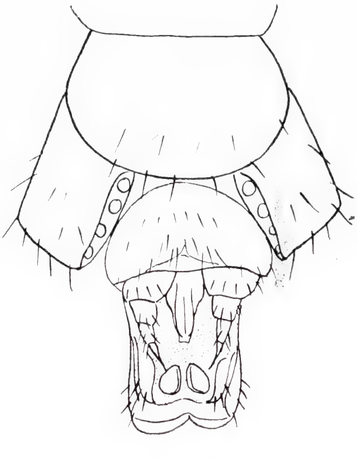
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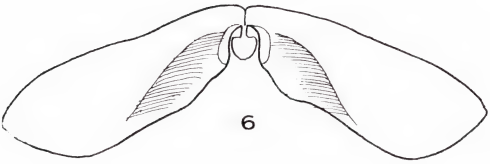
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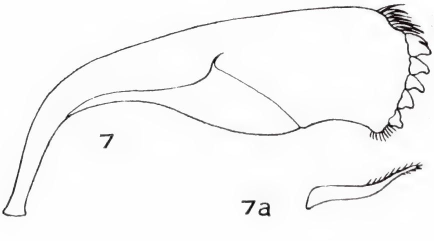
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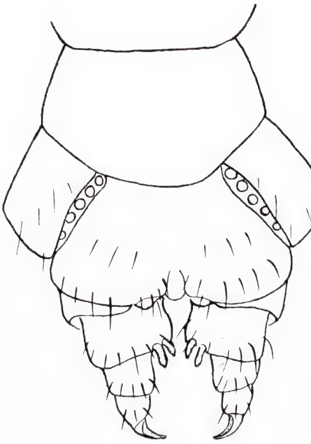
7a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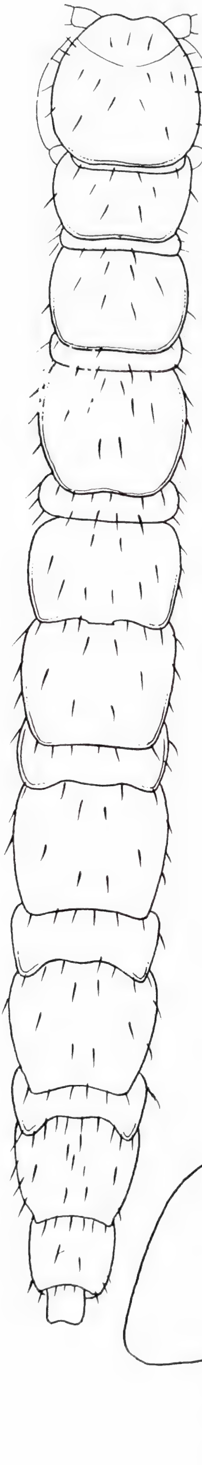
Figs. 1-5. *Paralamyctes validus* Archey.
Figs. 6 & 7. *Wailamyctes trailli* Archey.

PLATE 22.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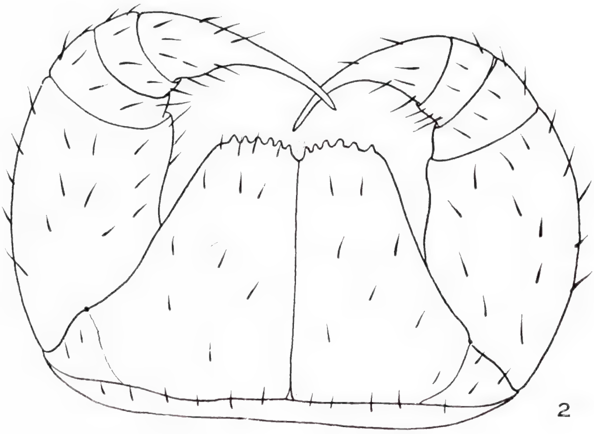
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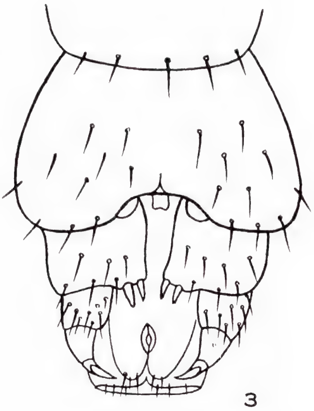
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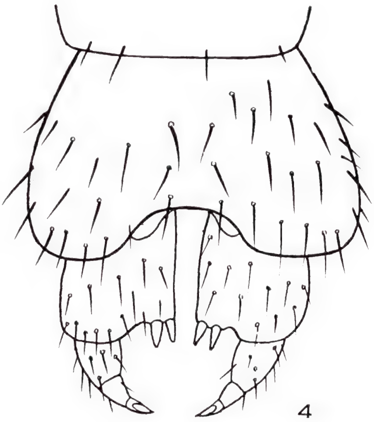
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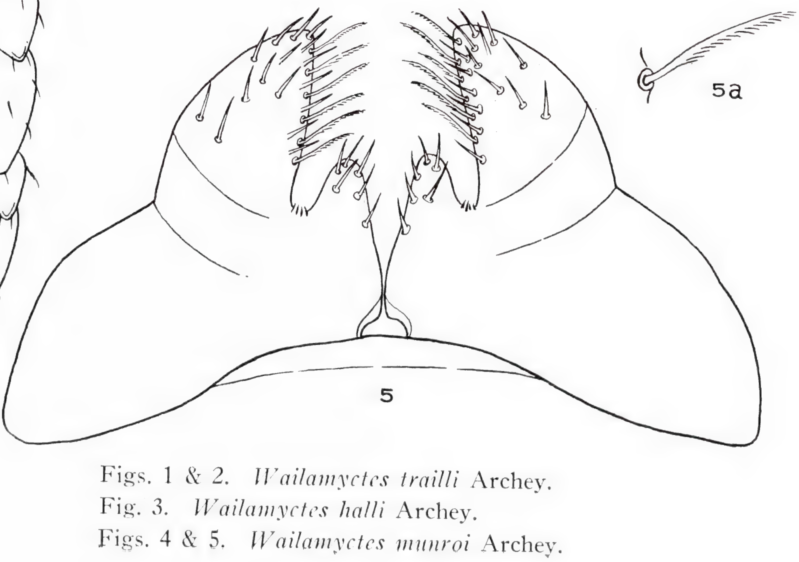
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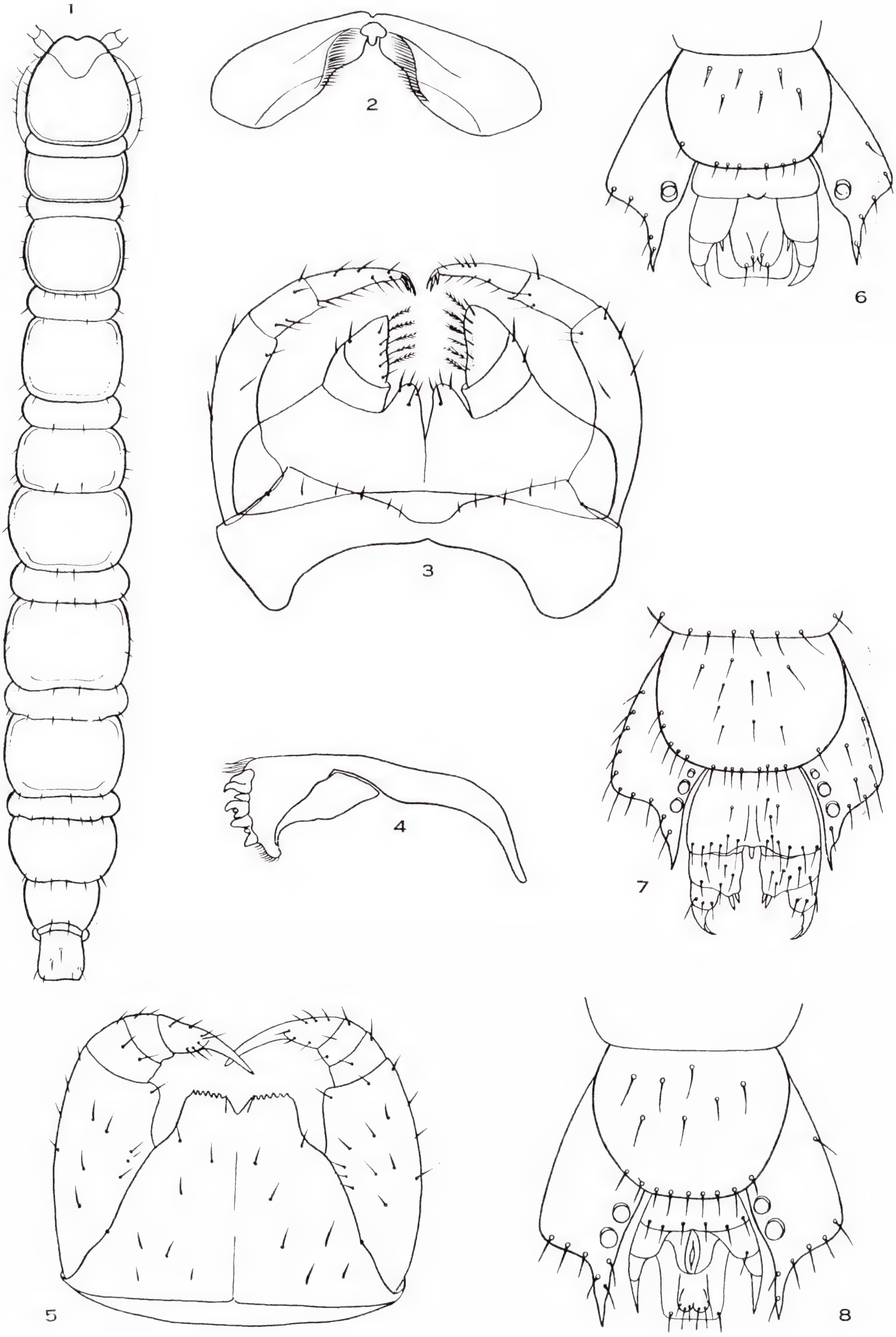
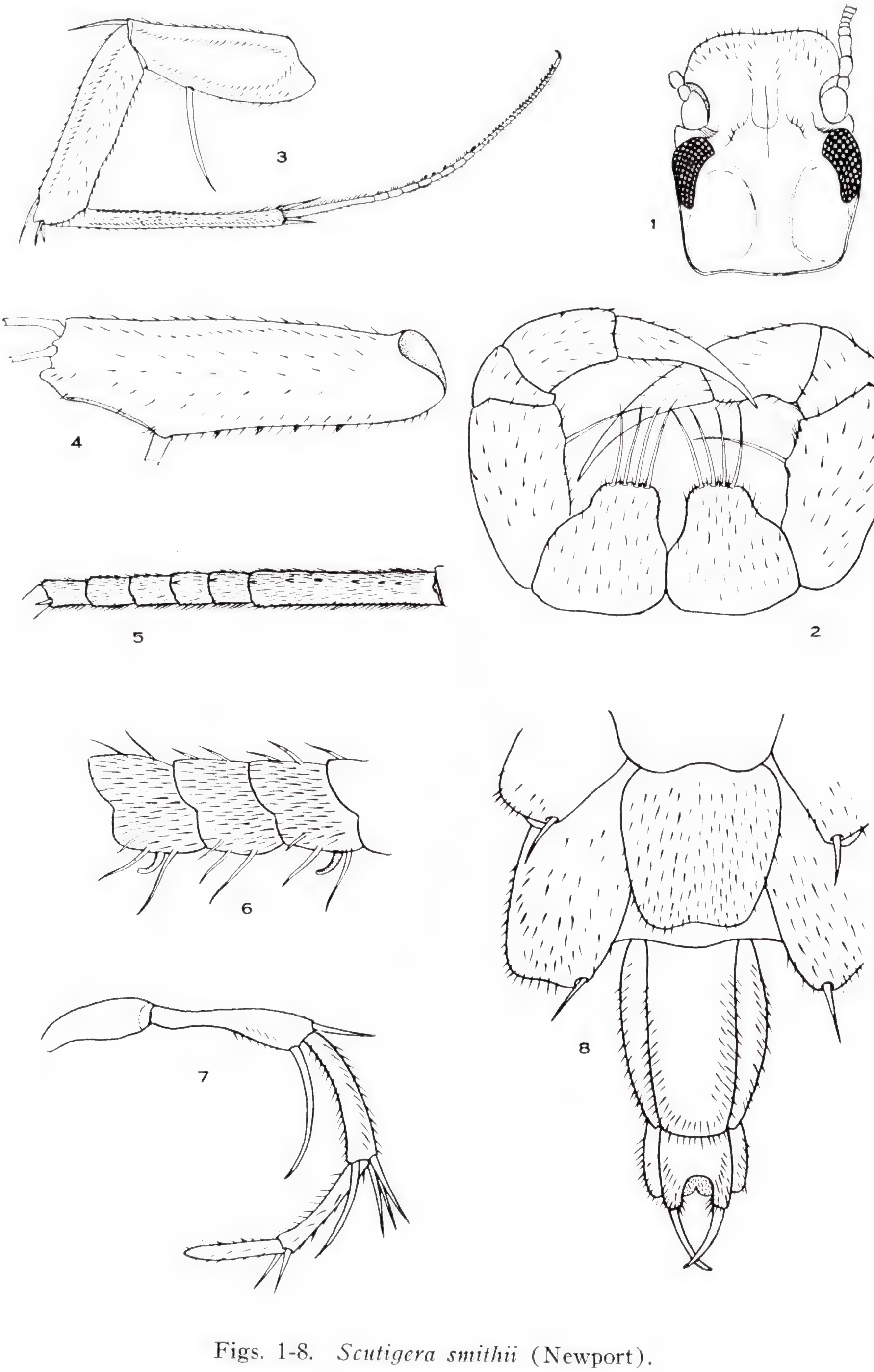
5a

Figs. 1 & 2. *Wailamyctes trailli* Archey.
Fig. 3. *Wailamyctes halli* Archey.
Figs. 4 & 5. *Wailamyctes munroi* Archey.



Figs. 1-8. *Anopsobius neozelanicus* Silvestri.

PLATE 24.



Figs. 1-8. *Scutigera smithii* (Newport).